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ABSTRACT

This collection gathers together several papers reflecting the state of the art in the development of community-based programs in health sciences education. Titles and authors are as follows: "Issues in Implementing a Problem-Based Learning Curriculum at the University of Sherbrooke" (Jacques E. Des Marchais; Bertrand Dumais); "Students' Perceptions after One Year of Problem-Based Learning at Sherbrooke" (David Barbeau and others); "Involvement of Teachers as Problem-Based Learning Tutors in the New Sherbrooke Programme" (Jacques E. Des Marchais); "Impressions of a Community Orientation Programme" (Junaid Ahmad); "Community Orientation at Obafemi Awolowo College of Health Sciences, Nigeria" (Olanipekun K. Alausa); "Education for Health in Transition--The Response of Medical Education at Gadjah Mada University" (Coeli J. Geefhuysen and Radjiman); "Village Studies: An Introduction to Community Health for First-Year Medical Students" (John P. Musgrove; Simon J. Carson); "Centre for Clinical Epidemiology and Biostatistics, University of Newcastle" (R. F. Heller); "The Mindanao State University College of Medicine Community-Based Medical Curriculum" (Angelo H. Manalo); "The Area Health Education Center: A Model of Community-Based Health Sciences Education" (Daniel S. Blumenthal); "Health of the Public at Columbia: The First Year" (Oliver T. Fein and others); "World Federation for Medical Education" (Henry Walton); "Ten Commandments for Clinical Training" (Andrew R. Hornblow); "Knowledge, Learning and Literacy: The Didactic and the Critical" (Richard W. Paul); and "The Abuja Plan of Action: Arising from the African Ministerial Consultation on Medical Education, 7 July 1989, Abuja, Nigeria." The volume includes a list of recent books on medical education and abstracts from recent papers on primary health care, problem-based learning, change, student selection, communication, and assessment and evaluation. (LPT)

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PART I

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The Annals of Community-Oriented Education publish original investigations and descriptive or theoretical papers dealing with aspects of community-oriented, health-professions education. The Editors maintain a liberal policy concerning the nature of the subjects to be addressed. The Annals aim to encourage the study of instructional practices, approaches to student assessment and curricular aspects specific to this domain. In addition, papers addressing the broader issue of health care research will also be considered to the extent that they provide directions relevant for health professions education. The editors in particular welcome contributions from young investigators who are new to the field. The Editorial Board of the Annals sees as one of its objectives to help inexperienced authors improve their contribution, provided the subject is of interest to a broad audience and the study is methodologically sound.

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Editorial

This, the third Volume of the *Annals*, is witness to further changes. The most striking is the publications of the papers and poster presentations from the *1989 Network Conference* at Kerkrade in The Netherlands. These papers are presented in *Part II of Volume 3* under the editorship of Dr. Gerard Majoor. Part I, as before, opens with a number of papers from member institutions in Australia, Canada, India, Indonesia, Nigeria and Oman. The trilogy from Sherbrooke is of particular interest, as it presents the views and reactions of planners and organisers, the students, and the tutors in the Faculty's problem-based learning curriculum which has only recently replaced a traditional course - *not as a parallel track but for the entire class of students*.

The next following section is devoted to contributions from non-member institutions. It is gratifying to note that the pioneering work of the member institutions of the Network is finding an echo in exemplary innovations elsewhere in both the industrialised and the non-industrialised world. Indeed, the Network has been honoured with outstanding recognition by the *United Nations*. A letter written in October 1989 confirmed that the Network has been *"placed on the list of Non-Governmental Organizations in consultative status by virtue of its associations with the World Health Organization"*.

However, we would disregard at our peril what must be the primary objective of the Network - *to lend encouragement, help and support to each other and, in particular, to the leaders, teachers and their students who are involved in bringing about such important educational changes and on whom depends the successful continuance of these changes.*
The magnitude, energy and commitment that must be generated and maintained in the face of educational change has been demonstrated with elegant clarity by Dr. Sharifah Shahabudin in her paper *"Problems of Management in the Initial Period of Implementing Educational Change" (Annals, Volume 3, Part II).*

Some four hundred years ago Machiavelli said in his celebrated book The Prince:
"There is nothing more difficult, more perilous to conduct, or more uncertain in its success, than to take the lead in a new order of things, because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who many do well under the new. This coolness arises partly from fear of the opponents, who have the law on their side, and partly from the incredulity of men, who do not readily believe in new things until they have experienced them."

We hope that the present Volume of the *Annals*, both Part I and Part II, will encourage, support and assist our colleagues within the Network and that the *Annals* will continue to provide inspiration and wisdom for all those medical educators around the world who say with Descartes *Dubito ergo sum* - I doubt, therefore I am a thinking human being.

The Editors

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1990, Vol. 3, Part I, 9-23

FROM MEMBER INSTITUTIONS

Issues in Implementing a Problem-Based Learning Curriculum at the University of Sherbrooke

Jacques E. Des Marchais and Bertrand Dumais
University of Sherbrooke
Sherbrooke, Canada

Abstract

This paper discusses issues related to the total change of a traditional pre-clinical undergraduate medical course into a problem-based learning (PBL) curriculum. Other medical schools have either started with PBL from the very outset or have introduced change by establishing an innovative track for a small number of students in parallel with the traditional course for the majority of students. The paper reflects on the six issues that tend to be uppermost in the minds of academics who are faced with the prospect of change to a PBL curriculum: How will it affect the existing power base? Will the individual teacher be able to master new competences and what training will be involved? Will the new demand move expenditure of time, effort and resources? Is it really necessary to go all the way, or can the new be tried out in limited ways? What is the proof that the new is so much better than the old to make the change worthwhile?

Why Problem-Based Learning?

A curriculum that is centred on teachers and on disciplines is no longer a viable model for undergraduate education because of the magnitude of information generated by new advances in each discipline. In the conventional model of education there would be no other solution than to increase the number of lectures and to pack more information into each lecture. Teachers will then use more slides, sometimes with double screens. Some teachers would argue for an increase of the programme by one or even two years. The precious daytime hours of students are devoted to passive learning in ever bigger auditoria. Rote memorisation becomes the

Requests for reprints should be sent to Jacques E. Des Marchais, University of Sherbrooke, Faculty of Medicine, 3001, 12th Avenue, Fleurimont, Sherbrooke, Quebec J1H 5N4, Canada.

only way to assess student learning. Students react accordingly, first by cheating: packing their short-term memory to pass examinations and then rapidly forgetting everything in order to make room for the demands of the next examination. The students know that they have to pay the price of a few years' study of the basic sciences before they are permitted to enter into real clinical studies. Teachers complain that students are not very interested; studies have demonstrated that students get more cynical as they go through their undergraduate course. Can we really believe that, in spite of such a pedagogical regime, the brightest students will still be attracted to the study of medicine?

What, then, is the alternative? It would seem intellectually attractive to consider an instructional method which would place students from the very beginning in a context similar to that in which they will be working as graduates. Problem-based learning (PBL) is based on this assumption (Barrows & Tamblyn, 1980; Schmidt, 1983; Barrows, 1985). Simulated clinical cases, contextual learning, active student involvement, peer interaction, autonomous mode of learning, and working during the day on their own are all ingredients of a more stimulating learning environment. Here the main tasks are no longer concerned with memorising, only to forget after the examination, but with understanding the concepts of the underlying mechanisms that can explain the real problems that the students are challenged to tackle. The acquisition of clinical skills can here be integrated with the study of the fundamentals of medical science.

In the first two years of our curriculum problem-based learning does not call for the *solving of* problems but for *reasoning in* problems where students are challenged to apply basic sciences, mostly physiology, in order to explain the underlying causes of problems (Dornhorst, 1981). This is what members of the Faculty at Sherbrooke have discovered in applying the problem-based learning approach.

Studies in educational psychology have provided an even more fundamental reason to support PBL. Through problem-based learning students are challenged from the very beginning to develop their cerebral data base program in the same pattern as the one they will use in their future role as clinicians. We enjoy the experience of seeing our students from the new curriculum in their clerkship. We do not hear the same old complaint from their clinical teachers: "Have these students learned anything, or have they forgotten everything they were supposed to have learned?". The new goal of this educational adventure is to assist students to develop a cognitive construct that will facilitate information retrieval in the context in which it is to be applied.

Every medical school pretends to develop the self-learning habits of its graduates. Self-learning habits, autonomy in identifying one's own educational needs, searching for adequate resources, and being able to evaluate critically one's own learning are all basic skills of an autonomous learner. However, these skills will not develop as a spontaneous outcome of the undergraduate programme. They have to be acquired through continuous practice, experience, feedback, and peer assessment. Problem-based learning seems to be a powerful means for the development of these qualities.

This paper discusses the issues involved in the change from a traditional to an entirely problem-based learning curriculum in the pre-clinical years. Medical schools that contemplate changing to a PBL curriculum are challenging many basic issues. A series of questions, commonly raised by teachers, forms the framework for this paper which addresses six topics: power and authority, the "coveritis syndrome", teacher training, time and resources, the pace and the scale of implementation, and the value of such a change.

Change in the Curriculum

Founded in 1964, the Faculty of Medicine of the University of Sherbrooke, Quebec, Canada, offered a rather traditional curriculum, rather like the other 1400 medical schools in the world. In September 1987, we inaugurated a new programme for the whole First Year class of one hundred students. The new curriculum is student-centred. It uses problem-based learning as almost the sole instructional method (Barrows & Tamblyn, 1980; Schmidt, 1983; Barrows, 1985). The first cohort of students is now in its third year of the four-year programme. It began its clerkship in the middle of the Third Year, January 1990, so that the Medical School has completed the first cycle of its new problem-based learning curriculum.

Our Faculty is the first to report full implementation of a complete curriculum change to problem-based learning for the entire class of students (Des Marchais et al., 1990). Even though the Medical School is only 30 years old, its programme was considered traditional before this curriculum reform. The programme is delivered by two hundred full-time Faculty members. By North-American standards, our Faculty is rather small but fully dedicated to its academic missions. As a matter of fact, all academic clinicians belong to the same practice plan which requires that any income from external consultation, visiting professorships, etc. is handed over for use by the Medical School.

The change from the traditional to the PBL curriculum was facilitated considerably, because many prerequisite were already components of the old programme (Table I).

Table I. Characteristics of the old and the PBL curricula at Sherbrooke

	Old Curriculum	**PBL Curriculum**
Managerial design:	Matrix System	Matrix System
Basic sciences:	First Year	11 week biomedical units integrated in 14 units throughout two years
Curriculum design:	Organ-system	Organ-system
Participation by departments:	Many	Many
Lectures:	1645 hours	1 hour/week
Small group tutorials:	none	2 1/2 years
Clinical skills:	from the first year but not integrated	from the first year and integrated with the PBL units
Summative assessment:	every 4-6 weeks	3 times a year
Formative assessment:	rare	regular

For instance, the original curriculum used an organ-system approach, where each unit was delivered with the participation of several departments operating in a matrix management system (Clarke, 1984). However, the teaching of basic sciences through traditional lectures was the predominant component of the old system. Now PBL has achieved a natural integration of the basic sciences with clinical pathology. Summative and formative assessment were profoundly modified by the introduction of assessment by tutors, short essay questions requiring analytical competence, and by the reduction in the number of summative tests.

Reactions to Change

The answers to the questions, that many teachers ask when faced with the prospect of change to PBL, are offered in the light of a full programme of internal and external formative evaluation. Data were gathered for each PBL unit from students, tutors, and unit directors, as well as from written reports, rating scales and verbal feedback. A series of visits by consultants and external evaluators has also been organised throughout these first two years.

1) Power and authority

   * *"Surely professors - heads of departments will loose power?"*
   * *"If I cannot give my course of lectures will I loose authority?"*

For the teachers, the implementation of this new PBL curriculum has been a formidable challenge. It involved destabilising changes in their professional role; not the least of these changes was the descent from the professorial "chair" to the tutor's "stool". In those two years 150 teachers were involved in a tutor training programme before experiencing the tutor's role at first hand.

Of course, some departments may have lost power because of the non-lecture curriculum. They did not retain the same allocation of time throughout the reformed curriculum. Some basic science departments were more affected than others. However, the original, traditional Sherbrooke curriculum had already been integrated to a large extent because the content centred around organs and systems. This meant that it had not been entirely department and discipline dependent. As this organ system curriculum had been in place for more than 20 years, the change from the traditional was less radical than it might be for those medical schools where the existing curriculum is discipline and department dependent.

Institutions must consider the price they are prepared to pay for changing to a student-centred curriculum. An institution has many goals to attain in fulfilling its social missions. Its members have to decide which goals they value most at any one time. We would assert that the undergraduate programme is the School's primary mission. Departments have gained a new "pride" in participating in instructional units which have been greatly appreciated by students. Many departments have acquired more credibility because departmental contribution is no longer judged by the "star lecturer" but as a collective involvement for the success of a unit. A new marriage between clinicians and basic science teachers can be observed in some units; interactions between academics of different disciplines have progressed more in the last three years than during the previous two decades.

The new curriculum was presented to the basic sciences departments by telling them that they would become resources for individual consultation by students. However, this opportunity was not explored very much by students during the first two years. When students did consult these departments they complained that teachers tended to give mini-lectures and that time was too precious in the PBL curriculum to allow for consultations of that nature. Suffice it to say that some of the best lecturers have also become some of the best tutors. They have received good student evaluation. Those teachers, who have truly adopted the educational change, recognise with satisfaction that they exercise more influence over the students' learning as they become "facilitator". The tutor training programme has identified eight tasks in the tutor's role (Table II). Experiencing the tutor's role is the perfect agent for conversion to becoming a believer in PBL.

The curriculum reform has entailed a noticeable shift in academic power because of the way in which the curriculum content has been reorganised and the way in which managerial arrangements have become less department dependent. Some Faculty members have not yet recovered from this shock which they manifest through a subtle, passive resistance. However, others have compensated by increasing their research profile or by assuming a leadership role in the curriculum.

2) The coverage of the content

- *"As a professor, I will no longer be able to control the quality and coverage of the teaching of my subject."*
- *"Is it not very time consuming and, therefore, does it not inhibit full coverage of every subject?"*
- *"Will students know less than their peers at other universities?"*
- *"As a teacher, I will not longer be in full control of what students will cover."*

For some teachers, better content coverage means to be more descriptive in the explanation of mechanisms, for other teachers better quality means to study in greater depth. In the new curriculum students decide for themselves when they need to go to the cellular or molecular level. However, tutors can exercise a strong influence. In the early years of the new PBL curriculum, teachers as much as students, were uncomfortable and anxious about the coverage of content. However, the tutorials revealed that students covered a lot more ground than their peers in the traditional content that was confined to lectures and students' notes. Now each student has a personal library of books that they read and digest in order to find answers to the questions which they pose during the tutorial sessions.

After two years' practical experience, the system has matured to a point where

Table II. Tasks of the tutor

Tasks	Definition
1. Manage the PBL method	During the tutorials*, the tutor supervises the conscious andspecific execution of each of the ten stages of the PBL approach
2. Facilitate the functioning of a small group	The tutor supports or, if need be, assumes the leadershiprole. He tries tochannel the groups's energy to the task in hand
3. Guide the study of specific content	The tutor orientates the lerning of the students toward the mechanisms and concepts that have been identified asappropriate for that stage of the course
4. Support autonomy	The tutor ensures that each tutorial enables the group to experiment with at least one of the elements of the autonomouslearning approach
5. Support humanism	Humanism is expressed through scientific integrity, respect of values and empathy in one's relations with others. The tutor sees to it that a humanistic atmosphere prevails within the group
6. Stimulate motivation	Motivation, the internal strength of an individual, is the drive for any learning procedure; therefore, it initiates, orientates and allows him to reach his goal. The tutor intervenes in order to influence the student's motivation
7. Evaluate the learning	The tutor has the responsibility of measuring the capacity of the students' ability to manage their own learning
8. Collaborate in the administration of the study programme	As an intermediary between the students and the coordination of the study programmes, the tutor has to execute the managerial tasks of the system

* Tutorials are meetings of small groups of 5 to 10 students with a teacher who takes on the role of a tutor.

most teachers are more confident about the coverage issue, because assessment of students' performance has demonstrated how successful their learning really was. The students' point of view on this aspect has been documented in a separate paper in this volume of the Annals.

PBL requires that students analyse more than accumulate data. For example, in a traditional curriculum students are asked to describe in full detail the aetiology, signs, symptoms, etc. of a child's hip dysplasia. While this is like describing the geography of a country, a PBL curriculum offers students the experience of a journey through the country. They are encouraged to explore the pathology of a clinical problem, so that they have to learn to understand the symptoms and signs at a level of the fundamental concepts and mechanisms that serve to explain the pathological condition.

As a matter of fact, during the first year of the new curriculum the system got caught up in a "coveritis syndrome". Teachers reacted as if the undergraduate programme lasted only two years and were afraid to trim very much from the content of the old programme. The students felt very compulsive in a curriculum that seemed to set no limits to the content. Action was taken to lessen some of this obsession: the phenomenon was openly discussed; weeks that had not been time tabled were set aside to give students an opportunity to catch up; only two tutorials a week was set as the limit; two aspects of PBL i.e. generation of hypotheses and construct of concepts were reemphasized; and, finally, considerable pressure was put on the coordinators to enhance the importance of formative assessment as a guide and feedback of the students' learning.

3) Teachers' training

- *"Will all of us be able to function as tutors - facilitators?"*
- *"How much training will we be expected to undertake?"*

We realise that the most important prerequisite is the attitude of "liking to work" with young students in the apprenticeship of their profession. It is very difficult to become a good tutor without this fundamental ingredient. In our medical school, teachers attend five days of mandatory training before becoming tutors. The first two and a half day workshop is aimed at mastering the fundamentals of the educational principles and the systematic design of a learning activity. Then follows a one-day workshop on fundamentals of problem-based learning and its application in the Sherbrooke curriculum. The teachers are then requested to attend a two-day workshop specifically on tutor training. Here they develop expertise in guiding students in problem analysis and in becoming more adapt in influencing the group process. Only then are they ready to act as tutors.

In a student-centred system there is a complete shift in the teacher's role from instructing to helping the student to learn. Teachers are no longer purveyors of information. It is amazing how easy it really is to begin to act as a tutor. In our system one student, on a rotational basis, is the group leader. This permits the tutor to remain quiet while he gains confidence. After a year the tutors are invited to attend a one-day workshop. Here they are helped to master the necessary skills to become more active in guiding and stimulating students to analyse and reason in greater depth.

4) Time and resources
   - *"Will I have to give up so much of my time that my research and my private practice will suffer?"*
   - *"Is it not much more costly then the traditional curriculum: more staff time, more effort, larger library?"*

To act as a tutor in our system requires 62 hours a month, including assessment of students, for two months each year (Table III).

Table III. Teacher involvement in a four-week unit*

Activities	**Time (hours)**
Before	
- Meetings	3
During	
- Tutorials (8 hr x 3)	24
- Weekly meetings	4
- Preparation (8 hr x 1.5)	12
- Formative Assessment (1 hr x 8 students)	8
After	
- Meeting	1
- Summative Assessment	6
- Updating training	5
Total	62 hours

* Each fulltime academic untertakes to act as tutor in two such four-week units in a year.

Time for developing and planning a four-week unit is also required from the unit team. This was calculated at 250 professor-hours for the first year, 30% for the second year and 15% for subsequent years. We asked each fulltime Faculty member to commit himself for two unit tutorships a year, or one unit tutorship and one unit as instructor in the clinical skills teaching. This is the teaching commitment for the undergraduate programme only.

In the previous curriculum, we had 1645 hours of lecture time. It was found that each hour of lecturing required two extra hours for preparation. Thus 4935 hours of staff time were necessary. Beside time required for clinical skills, the two and a half year problem-based learning in 18 units of four weeks needed about 6480 hours of teacher time. Therefore with the new programme, we have increased the institutional teaching load for the undergraduate programme by 30%. In our system, each department is expected to commit a total of 35% of its members' professional time to undergraduate, postgraduate (residency programmes), graduate (MSc, PhD), and continuing education. The departments are responsible for the allocation of personnel to meet the needs of each of these programmes. Every institution has to decide what resources should be dedicated to the undergraduate curriculum. This is a value judgement. Obviously it is more economical to keep a hundred students in one lecture theatre with one teacher. Is this perhaps too cheap as the institutional format of education for the future elite of our society, those who will take care of the health of our citizens? A fair amount of resources are already devoted to maintaining medical schools. Our institution thinks that the new PBL curriculum is slightly more costly but of a better quality. Every institution has to decide how far its teachers should be involved in the undergraduate curriculum. This is a fundamental question that must be answered with intellectual integrity.

The allocation of student time has been transformed profoundly in the new curriculum. Apart from six hours for tutorials and three hours for clinical skills acquisition, the remainder of the week is free for independent study. One may wonder whether the abandonment of traditional teaching is adequately compensated for by this somewhat "free style" of education? The answer came to us during the first semester of the third year. Some teachers were flabbergasted to observe how much students had matured intellectually during those first two years. Theese students were confident, critical and open-minded in their thinking about quite complex problems. They had become very clever in organising themselves during the small-group tutorials, and they respected each other's opinion. Unanimously, tutors considered these students ready for their clerkship.

It is also more costly for students. They have to buy at least a thousand Canadian dollars worth of books during the first year because of the necessity to acquiring a personal library. The total investment in books has so far been around $ 2000-2500 per student. One has to admit that a fair number of students in the traditional curriculum of Canadian medical schools manage to go through their study without buying very many books; they tend to rely almost exclusively on lecture notes. In some societies it is expected that students should invest in order to be educated as doctors; the attitude that the study of medicine should be as cheap as possible has there been abandoned. Our library should be better equipped, it is still underdeveloped; the University has not yet decided to devote more resources to the library.

PBL is heavily dependent on books. This may be a real handicap for developing countries; we see no other solution than to rely on study rooms and libraries, equipped with textbooks, where students can share resources. One of the most important factors in implementing a PBL curriculum is the availability of small rooms for tutorials. A strategic use of such rooms is not a difficult administrative task.

5) Pace and scale of implementation
   * *"Can PBL be introduced piecemeal, for example by a single deparment?"*
   * *"Can PBL be used with students as a whole class, rather than in small groups?"*
   * *"Can integration of the content to be studied be managed by a depart mental - instead of a Faculty-centred organisation?"*

When we were considering how we would implement PBL, one of our consultants advised us not to contemplate a piecemeal option. After two years of implementation, we still think that the consultant was right in his views. No study has yet been published to demonstrate that a piecemeal introduction is a realistic possibility. Medical education has experimented with only two main strategies for a full implementation of PBL: parallel tracks, and whole class implementation by new medical schools. The Sherbrooke model also represents full scale implementation but in an *established* school. It was the only such example until 1987, when the University of Hawaii began the same adventure (University of Hawaii, 1989).

A piecemeal introduction of PBL may seem attractive from a theoretical point of view: a few problems for a discipline, one discipline at a time, or one system unit at a time. With all these alternatives students will have to alternate to and from the PBL method, a very difficult intellectual task. With all these alternatives students will have no opportunity to acquire the necessary skills to become fully competent in the application of the method. However, there is a more important fundamental reason: problem-based learning means taking charge of one's own learning within a less structured educational programme. It can be argued that the younger the students, the more they need to move completely toward this autonomous format, because they are also in the process of acquiring their own personal autonomy in life. In traditional curricula, a few bright students have already demonstrated that it is possible to study medicine without participating in the official programme. They develop an autonomous, parallel curriculum for themselves. In the PBL system, this antonymous style is enhanced in the context of a sequence of problems and clinical activities organised by the staff, so that all students will have a fair chance to master the knowledge, skills and attitudes needed to become competent doctors. Moreover, the problems offer a powerful impetus for the integration of learning in the context in which it is to be applied in subsequent professional practice, one of the key advantages of the PBL instructional approach.

* *"Can PBL be used with students as a whole class, rather than in small groups?"*

To practice PBL in a large group would seem to be an intrinsic contradiction of the fundamentals of the method. PBL involves personal interaction and involvement, autonomous progression and personal feedback for each student. How could one compromise with a large group? Some students would be more active, while others would adopt a more passive role. Teachers leading problem analysis with large groups of students represent a different instructional method with its own potential, but it should not be confused with PBL.

* *"Can integration of the content to be studied be managed by departmental - instead of by Faculty-centred organisation?"*

Medical education has demonstrated that it is no longer adequate to manage the undergraduate curriculum on a departmental basis. The department is essentially devoted to the evolution of a discipline, and the content of every discipline has increased very significantly in recent decades. There is the well known confrontation within curriculum committees with the inability to reach a consensus by its members from different departments on the essential components of the curriculum. The judgement of what constitutes relevance in medical education generates vigorous debate around curriculum committee tables. Many institutions have decided to counteract these territorial struggles by having a Faculty-centred organisation, most frequently using matrix management (Clarke, 1984). This seems to be more effective in fulfilling the institutional mission of educating future physicians, at least for general professional education and more so if one contemplates implementing PBL. It may also be argued that interdepartmental collaboration and, therefore, Faculty-centred administration of the curriculum, is essential for an educational system which fosters integrated learning by students. We were fortunate in Sherbrooke not to have to change from a discipline-based curriculum to a Faculty-centred organisation when we were in the process of implementing a problem-based learning curriculum. The traditional curriculum is influenced by the financial arrangement where the number of staff in a department is affected by the number of hours of teaching allocated to that department. When funds are administered centrally in an integrated PBL curriculum, the allocation of funds for the employment of staff within departments would need to be renegotiated with new criteria. Here, too, professors, who "fought" their way to the top because they like power, would need access to other forms of power to compensate for loss of conventional power in the curriculum (Clarke, 1984).

6) The value of change

- *"Is PBL worth all the trouble of introducing it?"*

First of all we agreed as an institution that our undergraduate curriculum was in need of major reform, because a series of weaknesses had been identified by a good number of fair minded Faculty members. Every institution is in need of evolution or else it will slowly regress towards *rigor mortis*, a state well described by the "curriculopathy syndrome" (Abrahamson, 1977; Guilbert, 1985).

Second, the introduction of the PBL curriculum has asigned a new importance to the role of the teacher. In the present context it is important to be fully aware that the missions of research and clinical service may drain all resources away from the mission of teaching. Time and again educational programmes are in need of being revitalised.

Third, introducing a PBL curriculum has brought many changes within our institution. Teachers from various departments were invited to get together at the time of the tutor training programme. It used to be quite common for teachers from different departments not to know the names and activities of their colleagues. The tutor training sessions were a good opportunity to discuss education with one another. This involvement in the collective enterprise of educational change has developed a new "esprit de corps". Many more teachers are now enthusiastic in their educational role after accomplishing with creativity the constructive development of problems and implementing the units. In an economical sense, the value of Faculty members is now worth a great deal more than in the previous curriculum. Finally, problem-based learning is a powerful tool to break down the rigid organisation of an undergraduate programme. PBL is the corner stone for changing the attitude of teachers and students toward a genuine student-centred curriculum.

Conclusion

Many reasons justify the need for initiating changes in the curriculum and adopting a problem-based learning approach, not as a dogma but as the currently most powerful instructional method. However, medical education has yet to prove that PBL is worth the effort and yields a better end product. Our own experience seems to lead to this conclusion. The first cohort has already demonstrated that the students have mastered their cognitive objectives in a very articulate way in "thinking medicine". We need to establish whether this trend will continue to develop.

Some evidence is emerging about the effect of PBL on how students learn. Schmidt, Dauphinee and Patel (1987) reviewed 15 studies that compared various educational outcomes of problem-based medical curricula with those of conventional programmes. These data suggest that PBL encourages an inquisitive style of learning as opposed to the rote memorisation and short-term learning strategies induced by conventional medical education. However, data with respect to performance on instruments measuring clinical competences are as yet inconclusive. Schmidt et al. (1987) suggested that schools with problem-based curricula would need to demonstrate that their graduates were superior in clinical competence. When should this evaluation be done: at the end of the pre-clinical phase of the undergraduate course, at graduation, or at postgraduate levels? Is it appropriate to undertake so much change in the first years of the undergraduate programme without also reforming the clerkship itself? A PBL pre-clinical curriculum offers the best ingredients, the educational prerequisites for an educationally sound experience during the clerkship: an autonomous mode to master medicine, a capacity for systematic reasoning through clinical problems, a habit of self-evaluation and the skills to interact with peers in learning tasks. It is difficult to conceive of transforming the traditional curriculum into a PBL curriculum, without a comparable modification of the clerkship: this is our current challenge.

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Students' Perceptions after One Year of Problem-Based Learning at Sherbrooke

David Barbeau, Josée Quesnel, Béatrice Des Marchais
University of Sherbrooke
Sherbrooke, Canada

Abstract

In September 1987, a new concept of teaching changed how students study at the University of Sherbrooke, Faculty of Medicine (Sherbrooke, Quebec, Canada). Students, who were used to the lecture format and unfamiliar with group work have since striven to adapt to the new programme and, ideally, to become its proponents. This paper presents our general impressions of the programme, as well as milestones in our journey into this new curriculum which favours self-directed and problem-based learning. We are confident that our perceptions fairly reflect those of our fellow students.

Introduction

This report is structured around those elements of the programme which have particularly affected students' life and which have a significant impact on the process of developing clinical competence. Each aspect is discussed by stressing problems encountered, adaptation needed, suggestions, and issues that remain unresolved. A general review is followed by a discussion of some of the problem-based learning steps (Schmidt, 1983): learning goals, individual study, group problem synthesis, and individual review of the problem (Grand'Maison, 1988). Finally, we address the notions of teamwork, tutors, and evaluation processes.

General Impressions

The first week of the curriculum introduced us to problem-based learning methods (Barrows et al., 1980). This was very useful. Over a year later, we still appreciate that the whole class agreed on how we would conduct problem-based learning (PBL). We were trained to apply the steps involved in PBL to the problems which form the core

Requests for reprints should be sent to David Barbeau, University of Sherbrooke, Faculty of Medicine, 3001, 12th Avenue, Fleurimont, Sherbrooke, Quebec J1H 5N4, Canada.

of the programme.

During the second week, problems of medical ethics provided us with an opportunity to put the steps of PBL into practice. Because of the less demanding workload during these first two weeks, we were able to get to know our classmates and become acquainted with the university environment.

The next ten weeks were related to medical biology and were a drastic change from the leisurely start. Initially panic pervaded the class, especially among students without previous university experience. The atmosphere really improved as most students learned to be more relaxed, to face study with confidence, and to cope with stress. From the beginning, this curriculum has given us a wide variety of problems on which to centre our learning. From our point of view, a good problem consists of a real situation containing a progression of information, with an evolution of the clinical history, accompanied by laboratory tests and didactic material. We prefer shorter problems of about 25 lines, in order to have enough time to adequately analyse its different aspects.

We eagerly anticipated starting the last twelve week unit of the year on complex problems. Unlike preceding units, its title (e.g. Hematology, "Week of Anaemia") would yield no hint as to its content: we will have to depend solely on our own capability to identify the systems involved. We also appreciate that topics recur in different problem areas, so the previous learning can be applied and complimented by the introduction of new information through PBL to make the whole process more realistic.

Steps in Problem-Based Learning

In the following section, we will discuss those PBL steps which were problematic in adopting the methodology.

Identifying Learning Objectives

From the outset, we realised the importance of defining learning objectives. A lot of students felt insecure when confronted with all the information to be covered. In fact, we thought we had no other choice than to read all the references and understand every detail of the chapters, as they were strongly suggested by the material given to us. We reduced the stress to a more acceptable level by determining more precisely our learning objectives and ranking them in order of importance. Clear objectives allowed us to filter our reading. However, it continues to be difficult to resist the temptation of trying to understand every single detail and to study aspects of the systems that were not directly concerned with the problem in hand. Reconciling specific objectives and compulsory reading remains a puzzle. Fortunately, students gain confidence and rely increasingly on their personal choice of texts.

Individual Study

We aim at understanding and assimilating the concepts, so that we can give clear, exact and concise explanations in the group synthesis of the problem during the next tutorial. Answering our numerous questions requires extensive research. This approach consumes a great deal of time and energy, often in solitude. When the objectives direct us to a greater number of concepts than those concerned with the problem itself, our work becomes somewhat monotonous; our reading then becomes the focal point instead of investigating aspects that will help to explain the problem. We should mention that the cost of textbooks is quite high, especially during the first year. Each student has his own collection of basic texts in his personal library. The majority of these books are still very useful for the next year, especially for students who prefer working at home rather than in the Library. Some students prefer to read a lot of review articles in journals, relegating textbooks to a secondary role. We frequently discuss the problem with each other, share interesting references, and sometimes even divide between us the task of writing notes. After all, this step in PBL focuses on both cooperation and individual work.

Developing a comfortable working method that enables us to assimilate individual aspects fast, while maintaining a global view, is a trial and error process. We agree that the new curriculum demands a considerable personal investment, but it also makes our work schedule more flexible. The topics are so vast that we could spend all our free time studying, forgetting to allow time for leisure activities.

Summarising Problem Explanations

Most groups begin this step by agreeing on a plan for the discussion. Some students prefer to talk only about the points that are not clear; the group will then attempt to answer everyone's questions. This approach proves unsatisfactory for group members who like to leave the tutorial with a comprehensive view of the concepts inherent in the problem. They prefer discussing each aspect rapidly in the group. However, when they exchange obvious explanations or recite what they have learned by heart, group energy drops rapidly.

While some students prefer taking their own notes, others appreciate having a secretary and a transcriber to provide a written summary of the discussion. Drawing

Figures and Tables on the blackboard has proved to be an effective way of bringing together the newly acquired concepts.
The most satisfying structure for group synthesis appears to be to outline on the blackboard the concepts related to the problem and to fill in secondary information. This cuts down time spent on less important details.

Review of Problems
Filling in gaps noted during group review would be facilitated by having weekends free. Not infrequently we have a new problem to analyse during weekends. This results in a seven-day school week. Suggested improvements include a three-day weekend, which would allow review of problems previously encountered and it would allow for time to relate concepts from different problems for greater integration.

Let us now consider the problematic week preceding each of the thrice yearly examination periods. Should it serve as a time for individual study or for the group to integrate the systems we have studied? Students' opinions are divided between two possible solutions. One proposal is that a personal study week should assist integration through the use of problems which we can analyse alone or with friends. The other proposal is for the groups to use the week for integration through problems that do not involve grading by the tutor and is preceded by weekends free for review.

Team Work

Team work is absolutely essential for problem-based learning.
In the first months of the programme, inter-student friction frequently emerged in the form of distrust between team partners and uneasiness with the roles of group leader and secretary. Some talked too much, others not enough, and explanations lacked clearness and structure. We would often engage in circular arguments, each wanting to explain the same thing his own way. The end result was overly long tutorials in the beginning.
Exchanging our opinions on group function had a major impact on improving group effectiveness. Confrontation with the breadth of knowledge of our peers forced us to compare ourselves; subtle competition sometimes arose, leading to greater coverage of the content. Respect and increased confidence among team members has significantly brightened up the tutorial atmosphere.

At this juncture, we realised the importance of the role of an ideal group leader: he should refrain from taking part in discussions, act as an observer, stimulate students to clarify their comments, and facilitate more equal student participation. He should also be able to involve the quieter students in the discussion and to manage time effectively.

One way in which we enhanced tutorial effectiveness was the development of a new role: the transcriber. His task consists of taking down whatever is written on the blackboard and taking notes on the major points discussed during summarising of Problem Explanations. His text is then distributed and helps the group to arrive at a consensus on what is most important.

Tutors

The role of the tutor appears to be a requisite of the problem-based learning approach. Two types of tutors were immediately apparent from the outset: those who gave lectures on every possible occasion and those who displayed the "omission syndrome" and thought that they must never talk. Constant tutor intervention undermines student confidence and inhibits the group in explaining the mechanisms of problems and fixing their own learning objectives. Tutors who never intervene usually seem unconcerned with group progress and not interested in the new method. Tutors, through their own experience and after listening to students' suggestions gain greater expertise and get closer to our concept of an ideal tutor. According to our understanding of the PBL method, a tutor does not need to be an expert in the subject to be studied. In fact, the tutor guide is supposed to be enough in itself to allow Faculty members to become tutors: being truly "interested in the PBL format" is the *sine qua non*. We prefer tutors who actively guide, mostly by asking appropriate questions at the most opportune moment, bring students back onto the right track, focus attention on neglected aspects of the problem in hand, and stimulate discussion. We also appreciate it when they share anecdotes from their personal clinical experience.

Another issue encountered was the disagreement among tutors on whether the tutor guide to the objectives should be given to students. The lack of consensus on this issue also generated insecurity at the beginning of the programme. We now have more self-confidence and believe in our own capacity to identify the right learning objectives.

Assessment of Students' Performance

This thorny question is certainly the greatest source of student anxiety, especially given that a new type of curriculum entails new ways of assessing students. At Sherbrooke, three different ways of assessment exist: tutor assessment of the students' group behaviour during tutorials, written formative assessment, and written summative assessment.

Students' Group Behaviour during Tutorials

This process begins with a student tutor discussion concerning the formative assessment of his work and behaviour in the group. The tutor then assesses individually the student's group behaviour and decides on his summative mark. The students place significant importance on receiving the tutor's formative assessment before their summative assessment. The discussion with the tutor may be very useful, especially when constructive criticism is offered. This allows for immediate adjustment of minor functional behaviour within the group. Unfortunately, tutors all too often feel uncomfortable giving negative feedback to students, frequently offering non-committal encouragement such as: "You are doing just fine. Keep it up."

Summative assessment can uncover students who are attempting to impress the tutor. However, tutors disagree on how and who to assess. Major variations are encountered from one unit to the next and even within a unit. This uncertainty is disquieting for the students, who wonder what is really expected of them.

In summary, we think the team work aspect of our education is important enough to be assessed, so long as the tutors are in agreement about it. Let us hope that, like the students, they will be able to adapt, and that the Faculty will train them to become better assessors.

Written Formative Assessment

Formative examinations help us to set boundaries for our work and reveal aspects that were not broached during problem analysis. We would prefer these tests to be representative of the summative assessment, but this is seldom the case. This is unfortunate, as formative examinations provide some of the few limitations that we have to the study of the topics. The other limitations are the time allowed for the analysis of the problems, the learning objectives, and common sense.

Written Summative Assessment

We are tested once every three months, not after each unit. This leaves students free to study for learning's sake, not just to cram for examinations as in the past. The great relief is that it limits the high-stress periods to one every three months. On the negative side, the stress encountered is great and, in a few cases, it can last as long as three months. The tests use multiple-choice questions (MCQ), open short answer questions (OSAQ), and problem-analysis questions (PAQ). Students generally prefer questions that require problem analysis, questions that are closest to clinical work. These questions do not focus on theory but on an understanding of mechanisms, which students really appreciate. MCQs, which yield the highest scores, are interesting when they require more than just a good memory. OSAQs are generally disliked, as they require rote learning rather than real understanding.

As for grading, there is still a lot of room for improvement.

Clinical Skills

At Sherbrooke, clinical skills, separated into two distinct parts, are taught as early as the second trimester of the first year of medicine. The communication skills section deals with the principles of the patient-doctor relationship, possible problems, and ways of facilitating interviews. In the section on data collecting, we learned about and practised taking medical histories and physical examinations. These skills are learned in small groups with a supervisor.

The clinical skills section has been plagued with problems, despite all the effort and enthusiasm put into it: the organisation has been unsatisfactory. The supervisors were frequently not aware of their specific tasks. For the most part, the clinical skills took a back seat to medical theory, leaving students to view clinical skills as of secondary importance. What might have been wonderful opportunities to integrate theory and practice have in fact proved last-minute affairs that fall short of PBL potential.

Of course, students were able to adapt as they have done many times since the new programme began. By literally following the reference book and expending a great deal of effort, we have successfully attained the goals set for this part of the programme.

Early Clinical Experience

The idea of three-week clinical rotations in small community hospitals, when we knew nothing about the clinical aspects of medicine, may have seemed strange for many students and health care workers. It did not take long before we realised that the people who organised this activity knew exactly what they were doing. It really was a fascinating, highly useful experience for us to see the health care delivery system from the inside, to talk to real patients suffering from real diseases, and to meet practising physicians.

The rotation occurred at an ideal time in the curriculum and was a welcome break after struggling through the very difficult unit on medical biology. Because it was so early in our education, we had no alternative but to consider the patient as a whole, not as a disease, because we knew nothing yet about disease. It was a beautiful lesson in humanitarianism that we think struck home. The rotation motivated more than one student and enhanced the interest and curiosity of all. Never a tutorial goes by without some student prefacing a comment with "As I saw in our early clinical rotation…". Learning new concepts and linking theory and previous experience has been just tremendous. Almost all of us heartily approved of the experience.

Conclusion

In summary, despite overall major improvements during the first year of the new curriculum, students remain insecure and continue to ask three questions:

- Am I studying the appropriate material?
- Am I covering enough material?
- Am I covering the same material as the other students?

In conclusion, it may be helpful to recapitulate the major limitations and advantages of the problem-based learning approach:

- It increases the potential work load of students.
- It is more demanding to work in groups, as we must be prepared to satisfy the demands of the group. However, this may also be considered a strong point, as it stimulates us to compare our learning with that of our fellow students.
- We learn to cooperate and to develop greater confidence in our peers and in ourselves. Consequently, competition is also somewhat reduced.
- It really motivates us to analyse instead of learning by rote and to actually be the centre of our medical education.
- It is also very formative to understand medical information more critically. Analysing published papers helps to develop a more critical way of thinking.
- The great flexibility is unanimously appreciated by all students.

Problem-based learning is really demanding and fosters insecurity, especially as we are the first class and have no one with similar experience to consult. However, we certainly do not miss traditional lectures and we would not go back to the old curriculum. We are glad to be the pioneers in this new programme which we find personally rewarding.

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Involvement of Teachers as Problem-Based Learning Tutors in the New Sherbrooke Programme

Jacques E. Des Marchais
University of Sherbrooke
Sherbrooke, Canada

Abstract

The involvement of the problem-based learning (PBL) tutors in the new medical curriculum at Sherbrooke was investigated. Four aspects were studied: how tutors perceive PBL, what the tutors see as their role and tasks, what they regard as advantages and disadvantages of PBL, and what advice they would offer to new tutors.

The interviews revealed that each tutor had developed his own personal view of PBL, specifically in relation to self-directed learning and coverage of content. The tutor's responsibility was identified as residing in three tasks: control of the content to be studied, facilitating helpful group dynamics, and encouraging deep learning.

The role of the tutor appeared to have a common denominator as students become the focus of the educational process. A close relationship with the students gives tutors an opportunity for role modelling, a major advantage of PBL. The most frequently mentioned disadvantage was loss of opportunity to lecture and thus a waste of the teacher's unique experience. Caring for students was revealed as the prerequisite of a good tutor and a paramount ingredient of PBL.

Introduction

In curriculum change, it has been suggested that there ought to be clear congruence between interaction among teachers and students and the original intentions of the planners (Engel, 1989). Adequate congruence between the components of an instructional system, its objectives, interventions by teachers, and assessment of students is expected in any innovation that is based on educational principles. This seems to be the underlying rationale which governed the proposal of the GPEP Report (Association of American Medical Colleges, 1984), as the education of

Requests for reprints should be sent to: Jacques E. Des Marchais, University of Sherbrooke, Faculty of Medicine, 3001, 12th Avenue, Fleurimont, Sherbrooke, Quebec J1H 5N4, Canada.

students is linked with the education of teachers. It has also been argued that the curriculum belongs to teachers who would try to transmit their values through their interventions, irrespective of the explicit, official curriculum. These two concepts of congruence and transmission of an implicit curriculum by teachers seem to be of paramount importance in implementing major curriculum reform. Such was the case in the complete shift at Sherbrooke from a traditional programme to one that uses the problem-based learning method (PBL) (Des Marchais, et al.), 1990).

The Faculty of Medicine, Sherbrooke University, P. Quebec, Canada revised its undergraduate curriculum over a period of four years and implemented in September 1987 a full class changeover from a traditional to a small-group, tutorial, problem-based curriculum (Barrows & Tamblyn, 1980; Schmidt, 1983). In January 1990, the first cohort of 100 students completed the pre-clerkship years and began a new clerkship designed to offer better educational experience to more autonomous students (Sherbrooke, 1990). The two and a half year pre-clerkship period includes a first semester of introduction and 13 organ system units, each of four to five weeks. The pre-clerkship phase ends with unit 14, a four month unit. This is the first semester of the third year and is devoted to the integration of previously studied material while students deal with multidisciplinary and more complex clinical problems. Throughout these 14 units, there is a half day a week longitudinal unit for the acquisition of clinical skills and humanistic dimensions in the doctor-patient relationship. In December of the first semester the students are sent to community hospitals for three weeks to be introduced to the sick, to the life of doctors and the world of medicine. In the middle of the second year, the students go back to community hospitals for two weeks to learn from real clinical problems. PBL has been the corner stone of this educational change in the pre-clinical phase (Table I).

Everyone agrees that the tutor is central to problem-based learning in small groups. Yet what do we know about the views, concerns and attitudes of our colleagues when they are required to act as tutors and when they are asked to participate in training for the role of PBL tutor? This paper examines how tutors perceive PBL in the new Sherbrooke curriculum. The perception of their role and their reflection on their general training in education and their specific preparation for this role are followed by reflection on what they consider to be advantages and disadvantages of their involvement in PBL.

Table I. The pre-clerkship phase

First Year	**Subjects**	**Time (weeks)**
Semester 1	- Introduction to PBL and Medicine	2
	- Medical Biology	11
	- Clinical Experience	3
Semester 2	- Growth, Development, Ageing	3
	- Nervous System	5
	- Psychiatric Conditions	4
	- Locomotor	4
	- Community Health	4
	- Clinical Skills *	
Second Year		
Semester 1	- Cardiovascular	4
	- Pulmonary	4
	- Renal	4
	- Clinical Skills *	
Semester 2	- Digestive	4
	- Infections Conditions	4
	- Haematology	4
	- Endocrinology	3
	- Gynaecology/Obstetrics	4
	- Sexology	2
	- Clinical Skills *	
Third Year		
Semester 1	- Multidisciplinary Problems	16
	- Clinical Skills Integration *	

* One half day weekly

This paper presents an opportunity to view the PBL tutor's involvement as a measure of the educational intentions which governed the Sherbrooke curriculum reform and as an indication of the extent to which tutors are able to adapt their teaching style to the PBL approach. The reader may also wish to link this study of the tutors' perceptions with the other two papers published in this volume: the administrative point of view of issues in implementing PBL (Des Marchais J.E., Dumais B.) and the students' impressions of adapting to this new format of learning (Barbeau et al.).

Method

Seven of some 150 tutors were asked to give their views on becoming tutors and on their involvement as PBL tutors. The sampling was designed to achieve a fair representation of various units and of the disciplines in the Faculty. The interviewees were chosen because they were known to be outspoken and open-minded, as well as good tutors. The seven teachers that were chosen tutored in thirteen units (Table II) representing all the different disciplines. Their ages ranged from 32 to 63 years with an average of 48 years of age. Five were French-speaking, while the others were "new-Quebecois" who began their professional life in Europe. These tutors had already acquired a fair amount of experience, as the average length of their tutoring was 170 hours, varying between 75 and 410 hours. They were spending an average of 35% of their professional time on educational responsibilities.

Although these tutors did not represent a statistical sample of the tutor population, they were chosen to represent a fair "illustration" of tutors' reactions to our PBL based course, with a representative range of formative experience relating to their previous teaching, as well as their professional and cultural backgrounds. The intent of the paper is not to identify specific or characteristic tutors' profiles, but to explore the range of perceptions of, and reactions in the initial period of the full scale adoption of the PBL method. The paper does not set out to draw generally applicable conclusions, but offers quotations from the interviews to illustrate a range of practical experiences in different aspects of issues related to PBL.

The author conducted the interviews in a relaxed atmosphere. Each 24 to 55 minute interview was recorded. The agenda of the interview was not discussed with the tutors in advance, apart from the fact that it would deal with their role as tutors. They were asked to be as open and honest as possible. The interviewer remained neutral; his interventions served only to rephrase a question or to ask for explanation without giving any positive or negative feedback, verbally or non-verbally. A synthesis of

Table II. Tutor profile in the study

	Unit served	Discipline	Age	PBL tutor experience in hours	% Educational responsibilities
1.	Bio med. Hematology Locomotor	Immunology	60	280	30%
2.	Nervous Locomotor Renal	Neurophysiology	63	180	30%
3.	Introduction Locomotor	Family	32	105	25%
4.	Bio med. Community Growth & Ageing Endocrine Renal	Radiobiology	51	410	45%
5.	Cardiac Pulmonary Unit 14	Internal Medicine	44	140	60%
6.	Urology Unit 14	Nephrologist	50	110	25%
6.	Obstetrics & Gynaecology	Gynaecol.	43	120	35%

these interviews is given here. The analysis of the results is presented under four headings: the PBL method, the tutor's role, the advantages and disadvantages of being a tutor, and advice for future tutors.

Results

The results are based on the responses to the questions that were asked during the interviews. The subtitles represent the author's interpretation. The illustrative quotations were taken from different interviews.

The PBL Method

Could you describe PBL as you see it?

Each tutor gave his personal perception of what PBL ought to be. The range of major characteristics identified included: encouraging generation of hypotheses, providing relevance for the study of medicine, encouraging self-directed study, controlling content coverage, fostering collaboration and dependence on good group dynamics, as illustrated in the following quotes.

Early Generation of Hypotheses

"Problem-based learning is a method that exploits to the utmost the student's ability to learn: his logical reasoning, the way he can get his information, explain, justify and discuss problems."

"The student learns to develop a feeling for things. In my opinion, we are dealing here with a sort of hypothesis without reasoning, the first impression in the face of a problem. For example, when facing a problem, the student's first question is 'What do you make of it.'"

The Relevance of Studying Medicine

"The doctor must act rapidly on an already structured basis of reasoning. He must reason within a framework of knowledge. The whole key consists of locating a new fact within this construct. Once it is well located, the rest follows naturally. This is the greatest advantage of the PBL method."

"It makes the medical course much more pertinent."

"I love it. As a learning method, it is something I would like to have done when I was at the university."

"I believe that, right away, the students will see how the basic sciences are applied

to a specific problem. This makes the course of medicine more like what the students expect it to be. With regard to problems, it makes the learning of medicine much more realistic."

The PBL Method, an Individual Endeavour above all else

"It is a learning process where the main actor is the student and where the teacher is the coach. If we had extraordinary resources, we could conceive a student-teacher ratio of 1:1. This would yield excellent learning, individual PBL."

"Ideally, it is a personal endeavour by the student who answers his own questions whenever he has to face a given problem. For example, when a student wants a given objective to be covered and the group does not agree, he will see to it himself one way or another. I think that the role of the group in the learning process is limited. Of course, it will motivate and support the student, but it will not prevent him from progressing by himself."

"We show the students a self-learning method, a way of managing on their own, a way of becoming rapidly familiar with the career they will later carry on as doctors."

"I also see in it the development of certain habits of self-directed learning."

Subjects, Objectives, Coverage-Mania, Superficiality

"The responsibility of the teachers is to determine the contents of what the student must learn."

"As a group, we still want to cover the material, hoping the students, after ten problems, will have reached the main objectives of the subject."

"We believe all the students will cover the same material. It cannot be so, for our problems are not prefect. Besides, even we have a hard time knowing where to stop in terms of our objectives."

"I think that PBL consists in using problems to stimulate the students into finding the basic physiopathological explanations needed for the comprehension of the problem."

"Even if PBL is an essential learning tool, students tend to use the method as a way of limiting certain aspects of study from the objectives themselves, and study them very superficially. I find that they do not go deep enough into their subject."

Group Dynamics

"When they learn in a group, they help one another. There is a lot of collaboration."

"I am impressed by the way students exchange information among themselves without conflict, with humour, and in a friendly atmosphere. There are communication skills which are practised and which must surely be reflected in their relationship with patients."
"I see it as learning that takes place through group dynamics. There is a lot of interaction. Surprises occur continually. As groups change, as well as the mentality within groups, any given problem may or may not lend itself to discussion. Sometimes, the group is dejected and loses all motivation. On other occasions, it is really boosted up."
"They learn medicine by blending emotions into it. They learn to live with their change of mood and their petty quarrels. They learn to live together while working on a problem. They learn to initiate sympathetic reactions."
"I am impressed to see how they respect each others' opinions. They listen even when they disagree."

It is surprising that, except in one instance, tutors were not very systematic, from a theoretical point of view, in their interpretation of the PBL method. Each tutor had developed his own personal hunch, as illustrated by their responses. Self-learning and content coverage were the only aspects that were mentioned by two tutors or more; this may, of course, be due to the small size of the sample.

Tutor's Role-Training

What training did you receive to help you in your role as tutor?
Faculty development in education has been considered a prerequisite for change (Grand'Maison, Des Marchais, 1990) in the implementation of the new Sherbrooke programme. Faculty development in education at Sherbrooke is aimed at two levels of educational competence: change of attitude toward a student-centred philosophy through the one-year basic training programme in medical education, and acquisition of specific skills as tutors through the basic tutor training workshop and the training update workshop. Only four of the seven interviewees had attended the tutor training programme; five others had taken the one year training programme (Des Marchais, et al., 1990), and three had attended both programmes. The interviewees were not very explicit about the impact of their tutor training. The following quotes from tutors illustrate the relationship between attitude change and specific skills acquisition.

"Frankly, I did not find these workshops very useful." "In two or three days, we do not have time to integrate the new concepts and to apply them usefully. There are just too many aspects and too little time."

"About the best training we can get it to interact with students as clinical teachers at the postgraduate level. It is the Socratic method; by questioning the student you give him the opportunity of showing you what he knows. Though you can add your own anecdotes or examples from your clinician experience, I find that the most important thing is for the student to feel that he is the chief person in the endeavour."

"It is the basic programme that helped me a lot in my tutor training. This programme focuses on educational concepts on which our task as a tutor is based. In the basic programme, we study specific topics such as facilitating techniques, assessment, various methods of role modeling - verbal and non-verbal, open-ended as well as partially open-ended questions."

"As tutor, one is more a partner in the group than a supervisor or active teacher. When we have understood this, the rest of the task necessarily follows. I do not need any training for that. We simply have to try and adapt ourselves. The training of tutors is, in fact, a matter of understanding and adopting a philosophy."

"I went to the basic programme in search of the technical skills of tutoring. Instead I created for myself a kind of matrix with the concepts. I lacked an understanding of educational principles. How to live with the tutor concept? Once we have understood the educational principles, we can easily apply them to our tutorial task."

Finally, here is an example where the interviewer (I) and a tutor (T) explored the perception of the tutor's role in greater depth:

I: *"What training did you receive to help you in your tutor's role?"*
T: *"None, it's selftaught!"*
I: *"Yet, you are said to be a good tutor. How do you do it?"*
T: *"It's inborn. In my family, we are all like that. My brother is a psychiatrist and he's excellent. I also have uncles who are excellent teachers."*
I: *"What, to you, makes a great teacher?"*
T: *"It's the teacher who's able to transmit his knowledge and helps the students to learn, but not as it was done in the old curriculum."*
I: *"But how does a teacher manage to do that?"*
T: *"It's a matter of personal contact. We must motivate the student."*
I: *"How can you motivate through personal contact?"*
T: *"By being myself; there is no special technique. I hold my students in high esteem; I'm very fond of them."*

The three tutors who commented on this topic presented variations on the same theme. The first referred to the Socratic discourse, an interaction between student and tutor through questioning; the second searched for educational techniques to develop principles, in order to interact with students; the third was based on a liking for students and wanting to influence them. The common denominator is that the student is the centre of the educational process.

The students-centred philosophy is easily expressed and understood, but not easily adopted. It is the most difficult change of attitude that we can expect in traditional teachers, and even more so in teachers of the basic sciences. The interviewees' educational training programme was not a criterion for their selection. In this small sampling of tutors it appeared that the one-year basic training programme had provided the greater influence in this change. This would not be very surprising, as the adoption of a student-centred philosophy is one of the goals of the programme.

Tutor's Role - Tutorial Preparation

What sort of preparation, if any, do you have to undertake in order to prepare yourself for each group session (tutorial)?

The better tutor has familiarised himself with the contents of the problem to be tackled during the session. The more expert he is, the less he feels the need to prepare himself for the group session. If he is not an expert, for example when the tutor is an obstetrician and the problem is concerned with cardiology, or a family-medicine physician is the tutor and the problem involves the locomotor system, he feels a greater need to be better informed on the contents. This was the general impression distilled from the interviews. Some tutors spent almost 15 hours a week preparing for their next tutorial. A few even followed their students' study timetable; they would identify the learning objectives and study in relation to these objectives, just as the students did.

With the explicit exception of one tutor, the general perception was a strong need to master the contents of the unit, in order to be able to interact appropriately with the students.

"In my opinion, we can lead the group through various interventions, but in order to help their reasoning, we must know what we are talking about. Reasoning is a continuous chain of knowledge; if one link is missing, we are lost."

Some tutors see their tutorial responsibility as a golden opportunity to revise the basis of medicine. They would like to be able to go through all the units as a new form of continuing education.

Tutor's Role - Various Tasks

How do you see your role as a tutor in the PBL process?

Even though teachers consider student motivation as the most important factor for learning, none of the interviewees mentioned it as a component of their role. They mentioned only three tasks: control of content coverage, facilitating helpful group dynamics, and facilitating deep learning. Assessment of students was mentioned, but only by one tutor.

Making Sure the Content is Covered

"The tutor is more or less the guardian of the truth, in terms of contents."

"The tutor takes on the role of a father. He must be attentive and not afraid to intervene when things get out of hand, as when there is a lack of discussion around hypotheses."

"Students also consult me for the meaning of various terms as if I were a dictionary."

"When you are the expert in the topic, you have a hard time keeping silent whenever things do not seem to progress."

"It is more difficult for us not to intervene during the first tutorial."

"I ask questions in order to focus their attention on the objectives."

"In the first year, we tended to act by reflex, like setting the targets for the student's learning, whenever the objectives were not clear. We always gave ourselves the right to intervene if students wandered away from the objectives. Our standard was to ensure that the students would abide by what we expected of them."

Tutor's Role - Facilitating Helpful Group Dynamics

"The tutor is the guardian of the learning process. By not being involved personally he can interact with the group's dynamics."

"If the group functions well, interventions are relatively easy and minimal."

"When we are not experts, acting as a leader in order to get the group to function well is far from reassuring. Will they say things that I do not understand? Since I lack competence, will they miss the point without my noticing it?"

"My role is to have fun along with the students by being, as far as knowledge is

concerned, one step ahead of them. This forces me to redefine my role, not as a distributor of knowledge, but as a facilitator of learning."
"Students often have difficulties in assuming the role of group leader. They wait until the tutor comes to the rescue by assuming this role himself. Not only do they accept this, they even hope for it."
"In my second and third year, I found my tutorial job more difficult. I came to wonder how to reach the 6 or 7 main objectives of my task: abiding by the method, getting the group to work well, making sure that all participate helpfully, seeing to it that the various PBL steps are followed, stimulating discussion, and keeping order when necessary. How could I reorientate a group which was going astray? This was when I began to question how I managed my task as a tutor."

Facilitating Deep Learning

"My questions are not intended to check knowledge but to facilitate physiopathological reasoning of the material. Thus my questions are only intended to reinforce the student's response and to encourage him to analyse his reasoning, nothing else. Near the end of the second tutorial I intervene a lot; I am twice as active as I was in the first. I leave them totally free. It's the student who facilitate discussion. During the first tutorial, I give them a lot of freedom, even if they are wrong. If they were wrong the first time, the second time around they will analyse the reason why they were wrong; that is what reasoning is all about."
"Last year, I became much more agressive towards the lack of deep learning."

Learning by Reflecting on Experience

"*It is important to help students to evaluate their attitudes to learning, as well as their attitudes towards one another within the group. These affect how they will relate to their patients later on. They must preserve civilized behaviour, even when emotions are at boiling point. The tutor's role also consists in helping the students to know themselves better, by reflecting on their own behaviour through the tutor's comments on the students and on the group as a whole."*

Tutors seem to see their role as consisting of only two tasks: making sure that the content is covered and facilitating the group's endeavour. Only one tutor mentioned assessment as one of his tasks. It is interesting to compare the tasks that were generated by the teachers, with those expressed in the tutor training programme.

Tutor's Role - Involvement

What do you regard as the joys, advantages and strengths of your involvement in PBL?

The teacher-student interaction is totally transformed in PBL. The discovery of the content, the way students think aloud, the demonstration of their reasoning, the cognitive challenge of understanding problems in a format where personal contact with students is constantly alive, attracts teachers to the tutor's role, as illustrated by their responses during the interview. It was also apparent that role modelling the various qualities of a teacher was much more rewarding than the delivery of information through lectures, the previous mode of teaching.

Demonstration of Reasoning

"In PBL interaction with students is different. We had the opportunity to give the same material to both the second-year students of the new programme and the third-year students of the former programme. The difference was dramatic. Students in the old programme exhibited little enthusiasm, even though I was told that my course was a good one. Some students would be knitting, others would be taking a nap during class. Questions were rare. In the new programme, students asked many questions during the tutorials. What was astonishing was that they asked fundamental questions, showing they had thought about the problem and that they had explored it in depth. Their questions were never superficial, and I can understand that non-expert tutors may have difficulties. They asked questions of each other before they consulted the tutor. They went deeper into basic physiology."

"I find it amusing to observe how, at first, they know nothing. Yet, they come to acquire for themselves all that I expect of them, everything that I would like to have given them myself."

"They learn how to reason rapidly. They are able to explain things quite rapidly and their discussions are very dialectical. They are more intellectually agile; they are not more intelligent but they express themselves better. They have acquired a remarkable verbal ability."

"Medical students are intelligent. In the old programme, we had to wait for them to be in first or second year of residence, before the results of their years of education became apparent. Now, we can see change at once. Students have much more self-confidence in their ability. Arguments presented by 'authority' no longer have the same effect as they used to with students of the former programme. These new students are enthusiastic."

"My greatest satisfaction stems from the fact that we are going to have graduates who were students in the new programme. They are superb. They are resourceful."

Contact with Students

"In the former programme, I saw them for just 5 to 7 hours in a year. I had no way of giving them any feedback. I did not know them."

"What has always struck me in lecture classes, is that I was interchangeable. Whether it was I or someone else who gave the course did not really matter. Apart from the fact that one teacher might give a better show, everyone was interchangeable."

"What I liked most was the contact I have with the students. I knew them by their first names and I knew how each one thought. I came to know them and respect them. When I used to give lecture courses, it was very impersonal."

"The other thing I like is the friendship I have developed with most of the students in my group. Before, when I lectured to a hundred or so students, I only knew a few of them. Now, with PBL, I know the name of all the students in my groups. I have come to know them much more intimately. We do things together, and links are woven that never existed before, above all at a more personal level."

"With each of my groups, we organise a social get-together usually at the end of a unit and mostly at my farm where I try, not always with great success, to show off my culinary talents."

Role Model

"I found the task of implementing a unit very enriching. For the past 10 years, we used to repeat the same courses with only slight modifications. We relied on experience. This time, we sat down and discussed and searched to find what were the really important aspects of each discipline. It was a great opportunity for us to do some cleaning up and to emphasize the more pertinent aspects of the subject."

"I feel self-confident when I meet people outside the Faculty who talk about problem-solving and learning with problems. Another thing that pleases me is that the students find our unit interesting. At first our way of planning the problems was questioned by many. The student's reaction was finally very favourable because of our creative imagination."

"I feel much more involved in the preclinical course than I did in the old programme. It is much more like our teaching with residents. Contacts are mote intimate and personal. With this method, I feel much more like a role model for the students than I did when I lectured in the classroom. I feel that I am contributing to something, not only in terms of medicine, but as a human being, as an adult with experience, as a doctor and a humanist in every day life. I see it as an opportunity for me to pass on to them my own view of society."

"We discuss a lot. The method enables us to explore other elements of the subject. The contexts are all interrelated. It is the great advantage of the method, for example, when we deal with the problem of abortion. At that level, I play the role of teacher, but in a much broader sense."
"I was a tutor for unit 14. This gave me the opportunity to review complex clinical problems outside my own specialty. It was for me a form of continuing education."*
"Another thing that brought me joy was to realise how mature the unit-14 students were when they delt with problems, such as alcoholism, that concerned them or their family. They shared their personal experiences with the group and, to my great surprise, did it with great respect for each other. Actually, they pursued the problem of how to tackle alcoholism and the family much more deeply than I had expected. One student even talked about his father who is an alcoholic..."

These tutors identified advantages which were closely related to their perception of the tutor's role. The tutor should help the students to learn about medicine through reasoning and by creating a new relationship between student and teacher where they come closer together and where the teacher can share his professional and even his personal experiences.

What do you regard as the frustrations, disadvantages and perhaps disappointments of your involvements in PBL?
Despite the joys and advantages of being tutors, PBL destroys the glamour of the "Doctor Fox Effect" (Naftulin, et al., 1973). Older teachers, mostly academics in the basic sciences, continue to harbour nostalgia for the lecture. Many feel sad that their unique expertise is used by only a small number of students. The pressure to re-introduce some lectures is well demonstrated by the following quotes. Because the teachers do not have an opportunity to mention all aspects of the basic sciences and because this content is not all spelled out in the tutorials, PBL seems to be a "quickie method". The constraint of PBL requiring more time, about 30% more, was mentioned only once. PBL is closer to adult education than to the secondary school system. It is hard for many teachers to be no longer the sole person responsible for the content that ought to be learned.

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* The unit (4 month) at the beginning of the third year, when all previous study is integrated.

Loss of Lectures

"As a teacher, when I began tutoring, I was somewhat disappointed, because my teaching activity became less important. I miss the satisfaction of giving an expert course of lectures, a satisfying course full of elegant exposition; that is now a thing of the past."

"What I find frustrating is not to be able to display showmanship before the class. I was much appreciated by the students. Now my role is less visible."

"I see the direct contact I have with the students as an advantage, but I miss the more formal contact I used to have with the whole class. I regret that I can no longer pass on my experience in this way. I feel underused. We do not use sufficiently other means of communications, such as courses of lectures. Students must be given adequate guidance particularly in their first year."

"Students do not use us enough as resource people."

"Another disadvantage of this method is that the transmission of knowledge is greatly reduced. The role of the teacher is that of a leader, and that is as it should be. But his role as a purveyor of knowledge should not be neglected. There is still room for lectures, particularly if they are given after the problem has been studied. The student need no longer be preoccupied with taking notes, once he has tried to understand the mechanism of a complex problem and has appreciated the nature of the problem and its difficulties. The experienced teacher, who is well aware of the difficulties and important aspects, can give his personal synthesis of the subject."

The Time Factor

"Another disadvantage of PBL lies in its rapid pace. The basic sciences are studied too hurriedly. There is not enough time to remember it all. It is within each unit that the students would need more time for reinforcement and revision."

"What I find frustrating is that the students are constrained by time and do not benefit totally from the method. The units are too short. Students pass from one unit to another without having had the time to assimilate, and benefit from the material. It would be better to have one or two weeks between each unit. This would provide time for consolidation. They could then review the problems, analyse them once more, ask questions and meet with the resource persons."

"Time is a disadvantage. My involvement with my students takes a lot of my time and energy. Such an involvement is very demanding."

Other Considerations

"One fear stills exists: Will our students pass the provincial and national exams?

I'am convinced they will, but we will not know for sure until next year. Our concern is with the end product."
"There is the problem of students who do not talk enough. When we question them or look at their notes, everything seems all right."
"Those who are more talkative and more active and alert have a better chance."
"After using the method for two years, students no longer bother with the details of the approach. It has become so familiar that the steps in the method tend to be ignored. The method becomes just a tool."
"I perceive two disadvantages. First, if we have a more difficult group, the initial weeks can be disadvantageous for effective learning. Then we can but try to make them function according to our expectations and see it as a challenge. Secondly, if the group functions well, we would feel like continuing with it in further units, but that is not possible."

We can perceive here the nostalgia felt by teachers who can nolonger present lectures. In the study of medicine, time will always remain an insoluble problem, so long as we have no alternative to compressing all the basic sciences into a course of just a few years. In any new programme there will always be the fear that the quality of the product may not be optimal, at least until a number of cohorts have graduated.

Advice

Finally, what advice would you give to colleagues who want to become tutors?
At the end of the interview, tutors were asked to give their final perceptions of PBL. My reward came at this precise moment. Just as we would like to see doctors caring for patients, so PBL provides the teaching of medicine with that essential ingredient - the caring for students, our future colleagues, a total reflection of the Hippocratic oath. I was surprised to hear this message brought out by so many tutors. Helping students to learn would become self-evident, once teachers adopt the attitude of caring for and liking students. The tutors' quotes are very illustrative of this sentiment. As clinicians must learn to live and work with ambiguity, so PBL tutors need to learn tolerance toward students and their mistakes.

Care for Students

All seven tutors agreed upon one aspect: *"A tutor must like his students and care about them."*
"If a tutor is not motivated, he should leave the job to someone else, even though that someone else is not a specialist. Motivation comes before medical expertise, whether

it be motivation for teaching or for students."

"If a teacher has a personality problem, if he is not accessible and likable, the system won't work. He must care for the students, be open-minded, listen to them and not try to force his views or himself upon them."

"It is a question of personality, most of all. We must be fond of the students and respect them. We must not start with the thought that we will show them something, but tell ourselves that they already know a lot and that, spontaneously, they will develop tremendously. We must respect them for what they are and not consider them as if they were children. It is not a problem of technique; it is more a matter of attitude and personality. We must have an open mind and accept that, at first glance, it may not go as fast as when we gave a lecture."

"The tutor must love teaching; he must like his role as an educator. He must get involved with the method and respect the students."

"We cannot only be spectators. We must participate, intervene and get involved. We must not take that as a chore that lasts a few hours. We must become immersed in the situation that the students have to deal with and try to help them as much as we can."

"We must learn to take each day as it comes within the group, let ourselves be surprised by surprises and be ready no to think too highly of ourselves."

"For anyone who accepts being a non-expert tutor, it may turn out to be very stimulating and motivating, as it permits him to get involved in the learning dynamics of the group without having the students expect too much from him in terms of answers."

"One more piece of advice: Really care for the students. They feel it right away. It is the most important thing."

Put up with Mistakes

"The tutor must be able to accept that some stupid things will be said. This can last some 10 to 15 minutes. In the end, students become aware of the situation without the tutor having to intervene. He has to be patient, keep silent and facilitate spontaneous correction."

"We must love our role as educators and be able to tolerate some foolishness during 20 minutes before truth comes out. It is not everyone who can tolerate this."

"What is most difficult is not being an expert. We must not be afraid of saying 'I don't know'. Often, tutors have difficulty admitting it; it is very personal."

"I always manage them through questions. Of course, they realise I am asking questions to get them back on the track."

To become a good tutor, one needs two basic ingredients: a genuine caring for students and a great tolerance of the students' mistakes. This is the advice that our experienced tutors give us. As a matter of fact, the tutor has to become an effective educator, not only a physician.

Conclusion

The PBL method can only be successful in a student-centred curriculum. In planning its implementation, administrators and a fair percentage of Faculty staff must be conscious of this orientation. This is the essential principle, the fundamental rationale where no compromise is acceptable. PBL leads to an important shift in medical education philosophy; the learner assumes a major responsibility for his own learning. Consequently, teachers in PBL need to acquire tolerance, confidence in the student's ability to learn and design, develop and monitor the best conditions to make this happen.

"The most important thing for tutors is to be familiar with PBL, to have children of their own and to prepare themselves for each session. Why have children? If one can marvel at a three or four-year-old child who experiences his first discoveries, then we will be able to marvel at our students and at the way they progress during their medical studies. In both cases, we are dealing with the same development, the same acquisition of experience. Our students start discovering at the age of nineteen or twenty, and the process will go on indefinitely..."
"We must get involved with the method and respect our students. We must avoid the age old trap where increasing age and increasing years of experience tend to lead to the conclusion that students are less and less capable."

And yet, the progression from traditional teaching to PBL as the main educational method takes time within a Faculty. Its genuine and complete implementation may take several years to achieve.

"We must get involved as a Faculty, in order to give a chance to those who feel insecure. During meetings, as well as within unit committees, we sense a certain undercurrent of resistance. As a Faculty, I believe that we have gone beyond that stage. As tutors, we must also go beyond that stage, believe in the programme and make the effort to see that it works. We must adopt a positive attitude, an open mind

and a genuine desire to get involved. It is then that the venture becomes gratifying. We must adopt change, in order to gain satisfaction."

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Impressions of a Community Orientation Programme

Junaid Ahmad
Student at Christian Medical College
Vellore, India

Abstract

A student's perception of the brief but significant educational experience of living and working in a village illustrated graphically the value of placing medical students in a situation where they can make their observations and deductions of the needs of their future patients.

Behind closed doors and under the keen, watchful eye of the group observer you endeavour to look calm and composed. The questioning begins and your pulse rate quickens as you answer question after question, some truthfully, others not so truthfully. And finally the much awaited question: "Why do you wish to become a doctor?". Before she has time to take a breath, you have your answer: "To serve the cause of suffering humanity".

Does medical education cater to suffering humanity or focus its attention on the urban community, which is but a minority? Medical education has been limited to textbook knowledge. Students attend lecture after lecture and soon acquire the necessary knowledge. They are now ready to diagnose and treat. Is this the role of a doctor to diagnose and treat? Is this the health he administers?

Health implies more than the mere curing of sickness. Health extends far beyond the four walls of a clinic room or operating theatre; it reaches out to the people, to the community and society at large.

Such an awareness was created in our minds during the Community Orientation Programme, organised by the Community Health Department. It was here that we were exposed to true village life, and, for a good many of us, this two week live-in experience was our first taste of rural India. It was a thrill to be able to identify with the villagers. The girls took great pains to wear sarees even if it implied an hour less sleep in the morning. No invitation to a meal was ever declined and every dish was

Requests for reprints should be sent to Junaid Ahmad, Student at Christian Medical College, Bagyam, Vellore-632-2002, NA District, South India, Vellore, India.

consumed in a spirit of enthusiasm, including kali and kool. Once a rapport had been established with the villagers, we found they could confide in us and share their problems. This doctor-patient relationship is a key-factor for good and accurate treatment and it has to be inculcated in the early years of our training.

Equality of wealth in India is a far fetched dream. Even in the small community of Mottupalayam we had the very rich and the very poor. By means of a carefully thought-out questionnaire we were able to assess the social and economic status of the people. Knowledge of this kind gives us tremendous insight into the nature and cause of various illnesses. It would be a grave mistake on the part of any doctor or student to ignore the poor economic background from which most of the patients come. Such knowledge is a stepping stone to better understanding and better treatment of the individual.

India is divided by rivers, streams and imposing mountains and has people of diverse religions and customs. Age-old traditions and beliefs have been passed down from one generation to another and have become part and parcel of the Indian. A good knowledge of the traditions and practices of a region are indispensable for the concerned doctor. The doctor must be able to work with the traditional practitioner in whom the villagers have immense faith. At the same time the doctor must curb any harmful practice and encourage good practices. To cite an example of the cooperation of doctor and traditional practitioner let us consider diarrhoea. Here the traditional practitioner persists in chanting mantra's to satisfy the patient, but at the end he gives them ORS and satisfies the doctor.

Emphasis has been laid on the importance of environmental sanitation. The prevalence of anaemia, skin infection and poor health conditions was attributed to the lack of toilets, soakage pits and drainage systems. We are now aware of the importance of health education for villagers; shutters of ignorance and illiteracy have to be lifted.

Studies on disability were carried out. An awareness of the level of prevailing disability, its causes and methods of prevention was created. Similar studies were carried out on the dietary habits of the people. A knowledge of those types of food which are considered as cold, hot, gaseous and good is necessary if we are to understand their beliefs. Often the mood of fun and lightheartedness was interrupted by the Departments of Agriculture and Fisheries. The information they had was useful as it provided ways and means of getting hybrid crops at cheap rates or purchasing cows at a subsidised rate. A good knowledge of the available schemes helps to raise the economic status of the poor.

Our stay in the village exposed us to the cruel discrimination against females. It is both a local need as well as an international need to raise the status of women. To quote Gopalan: "The girls of today will not only usher in the generation of tomorrow, but will also shape it. They are bound to contribute in increasing measure to the ranks of our future workforce. Considerations of national self-interest, as much as concern for norms of any civilised society, demand that the handicaps from which girls currently suffer, whether such handicaps spring from greed or poverty, should be eliminated from our society."

The nutritional status of children under five was studied by anthropometric measurements. We acquired skills in carrying out these measurements. Our findings once again pointed out the discrimination between males and females. The greater percentage of malnourished cases and sadly enough the severest forms of malnourishment were detected in the lowlier sect of our community - the females.

Coupled with our other activities we were given ample opportunities to develop certain clinical skills, such as drawing blood, immunising children, dressing wounds, and diagnosing simple problems. But perhaps the most valuable lesson of all was the realisation of the importance of teamwork and collaboration. We had students of dietetics, occupational therapy and physiotherapy, as well as students from the Biostatistics Department. With each group specialising in their own field, the overall performance was effective and well done.

The two weeks of fun, excitement and hard work drew to a close all too soon. Each student was aware of the great challenge that lay before us as future doctors, each was awakened to the potential within him to serve suffering humanity effectively. The effect of the COP, managed by the dedicated staff, will never fade or grow dim. It has been an eye-opener for us to the real needs of our country.

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Community Orientation at Obafemi Awolowo College of Health Sciences, Nigeria

Olanipekun K. Alausa
Ogun State University
Ago-Iwoye, Nigeria

Abstract

This paper presents a brief outline of the community-oriented part of the undergraduate medical course and illustrates how academic initiative can stimulate community participation.

The Obafemi Awolowo College of Health Sciences of Ogun State University was established in 1982 to cater for the medical needs of the people of Ogun State in particular and Nigeria in general. This medical school was charged with the major role of training competent and compassionate physicians, medical specialists, health educators and administrators.

The Ogun State Government designated the State Hospital at Sagamu, 55 kilometers from the mini campus of the State University at Ago-Iwoye, as the Ogun State University Teaching Hospital (OSUTH). Medical students who have completed their pre-medical and pre-clinical courses proceed to Sagami where they will undertake training in Pathological Sciences and Clinical Medicine for the award of Medicine Baccalaureus and Chirurgiae Baccalaureus (M.B.Ch.B.) (Ogun) degree.

The curriculum for the degree normally lasts six academic years, except for those who gain admission by direct entry who spend five academic years. From the very start great emphasis is placed on community-based medical training.

At different stages of the medical programme, the students undertake postings when they interact directly with the community at large to study their socio-cultural systems in relation to health problems. The students are under close supervision by Community Health physicians and nurses who are Faculty staff, as well as those who are employed by the State Government. This has brought about a cordial relationship between the community and the University.

Requests for reprints should be sent to Olanipekun K. Alausa, Ogun State University, Faculty of Clinical Sciences, PMB 2001, Sagamu, Nigeria.

The postings during the pre-clinical years are conducted in an area with about 500,000 people, while the postings during the clinical clerkships are confined to a smaller area of the State. The three State Specialist Hospitals are also used as training facilities for our students. Qualified physicians working at these hospitals are employed as associate lecturers by the College.

The postings have stimulated the interest of the communities within the State to such an extent that different communities now invite the College to establish its programme in their areas and offer facilities such as clinics, dispensaries, maternity centres, audio-visual equipment, classrooms, hostel accommodation for students and College Staff. Apart from cash donations, the medical school has also benefited from community projects such as a 62-bed ward donated by the Sagamu Conference of Clubs, nine consultant clinics refurbished and equipped by philantropists and company directors, and an accident and emergency unit has been refurbished through an individual donor.

Full accreditation was recently granted to the programme by the Medical and Dental Council of Nigeria. The College still enjoy the active support of the College Advisory Council, composed of a group of indigenes of Ogun State from diverse walks of life, who are all out for the maintenance and future development of the State University Medical School in all its ramifications. This is an example of community participation in the implementation of a community-oriented and community-based medical educational programme in a developing country.

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Education for Health in Transition - The Response of Medical Education at Gadjah Mada University

Coeli J. Geefhuysen and Radjiman
Gadjah Mada University
Yogyakarta, Indonesia

Abstract

The article describes the way in which the University is responding to the challenge of preparing graduates for a society in rapid transition, where young doctors are made responsible for the total health care of populations. The need for change has been accepted by the staff. Staff training in the Community-Oriented Medical Education (COME) programme, which was changed to a problem-based learning (PBL) model in 1985, preceded changes in the rest of the curriculum. Such changes have now begun, starting in the clinical clerkships.
The COME programme is based on a simplified iterative loop and a three-dimensional model incorporating the scientific method, the four loop dimensions and the problem-solving cycle. An overview of the topics is given in the Tables. "Dry" learning is offset by fieldwork related to the Government Health Centres. Attention is paid to the value of data collected for health service planning and monitoring.
Problems of 'student loafing', staff uncertainty, time constraints and material problems, mainly library and skillslab development, are highlighted. A train of change has been set in motion.

Introduction

The reason for change in medical education in Gadjah Mada University (GMU) has been the recognition that it has to prepare its graduates for their task in community-oriented primary health care (PHC) in the health services, while the need to keep up with modern medical technology remains. Both are necessary for appropriate care at all levels.

Health status and care demands in developing countries are not static and are

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Requests for reprints should be sent to Coeli J. Geefhuysen, Gadjah Mada University, Faculty of Medicine, Yogyakarta, Indonesia.

influenced by rapid changes in society. Previously stable villages are affected by urbanisation and migrant labour, with destruction of old family ties and rules, bringing in its wake unwanted babies, venereal diseases, neglected old people, wild youth, drugs, alcohol and the results of traffic accidents. These challenges are added to the old problems that have not yet been resolved. In urban areas crowding is added to the troubles, and, in the more affluent, stress diseases, diabetes and neoplastic diseases are demanding attention.

In Indonesia, as in most developing countries, the delivery of health services greatly differs for the large number of rural poor and the urban crowds, and for the much smaller but more vocal middle and upper class groups. While the first are catered for by the State National Health Service (NHS), the second, often demanding inappropriate procedures, try to pay for their own care in private clinics and hospitals. The NHS is not free, but fees are lower than in private facilities.

New graduates staff most of the vast network of government health centres across the country, where each doctor is responsible for the health and medical care of 30-50,000 people in a large administrative unit. These doctors are also expected to be able to refer appropriately to regional and more central state hospitals. Since their salaries are inadequate, they are allowed to run private practices for fee paying patients. The demands are frequently contradictory.

Medical schools need to equip the graduate with the means to make appropriate choices under conditions of economic constraint. The provision of facilities and services are frequently determined on political grounds.

No traditional medical faculty can fulfil the demand for the knowledge needed for all these eventualities. A graduate placed in a remote rural situation will need a totally different quantum of day-to-day knowledge than one placed in a central city area. Moreover, rapid changes will make much of that knowledge out of date in a very short time.

The recognition of the shortcomings of the established methods meant that a new approach to teaching was essential.

The Phase of Decision Making

The inadequacy of care for large masses of the poor and the failure to fulfil the demands of even the affluent in developed countries with only the technological approach to medicine, led to the Declaration of Alma Ata in 1978. Thus, the idealistic principle of participatory health care was ratified. With this ideal in mind, the Comprehensive Community Health Care (CCHC) programme was started at GMU in the mid-seventies with the help of the Rockefeller Foundation. The programme was multidisciplinary and largely based on small groups.

The principle of the need for a PHC programme took firm root, including the need for field experience and the advantages of small group learning. The programme itself, however, soon started to wilt despite incantations to the contrary.

A major reason for the failure was a fundamental difference between the idealistic principles evinced by the originators and the realities of the health services and the hierarchical structures in which graduates have to function. In addition, many of the most commited local participants were sent on fellowships overseas, and the consultants were withdrawn concurrently. The Faculty was not able to fill the gap at that time.

Renewal began with a change in Faculty management in 1985 and a redefinition of the desired 'endpoint'. In the search for a new strategy of learning, the problem-based learning (PBL) approach was accepted for two pragmatic reasons: 1) tutors from different disciplines cannot serve as experts in fields other than their own, but can guide learning generally, and 2) the student needs to develop self-learning and problem-solving skills. It is not useful to learn numerous facts needed by specialists which would be inappropriate in most of one's subsequent working life.

Since 1985 when the change of the CCHC to the more appropriately named problem-based COME programme began, the process of reflection has continued. The involvement of a variety of previously uninvolved staff members in module production and supervision of the COME programme brought the recognition that natural learning is triggered by a need to know which does not respect the boundaries of traditional disciplines. A decision was made to train the students for their main task in the peripheral health services. It was also realised that the learning principles of integration and PBL had to be incorporated into the entire curriculum.

The essential condition for change, namely that a sufficient body of the Faculty agrees that change is needed, has now been fulfilled. However, the degree of change and the manner of innovation at each level of study is still under discussion. A plan has been drawn up to transform the traditional curriculum into an integrated, community-oriented form, even though small groups will not always be used. The decisions were not made in a vacuum. At high levels in the Government the need to improve medical education was recognised and encouraged. Internationally, there was much contact with the Network of Community-Oriented Educational Institutions for Health Sciences, and the options used in other innovative institutions were carefully observed (Soenarto, 1989).

Implementation

The GMU Medical Faculty caters for approximately 150 students per year in a 6 year two-phase curriculum consisting of 4 years class-based work and 2 years of clerkships. Each year has two semesters. The core curriculum and credits are laid down nationally. COME programme activities (10% of the curriculum) take place in every year. The problem-based programme started in the 1986 academic year.

Problems are constructed to cover health priorities in the population. There are few examples on which to model these in contrast to patient problems. Behavioural and social aspects and the health professional's problems as a clinician, as a public health doctor and as a health service manager are not forgotten.

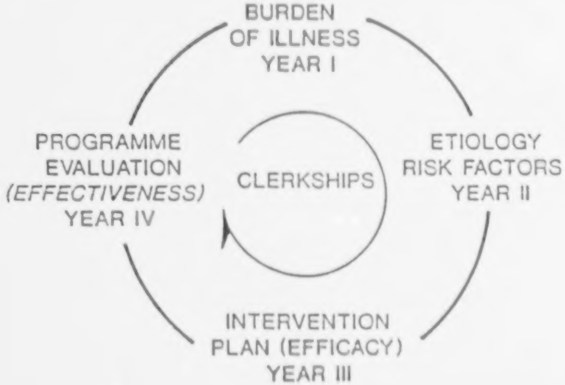
BURDEN
OF ILLNESS
YEAR I
ETIOLOGY
RISK FACTORS
YEAR II
INTERVENTION
PLAN (EFFICACY)
YEAR III
PROGRAMME
EVALUATION
(EFFECTIVENESS)
YEAR IV
CLERKSHIPS

Figure 1. Simplified iterative loop (Tugwell et al., 1985)

In each of the four components (Figure 1) students go through increasingly higher levels of cognitive activities. One of the dimensions is emphasized in each theoretical semester (Figure 2), though the context of the loop is made clear from the beginning.

In order to solve the problems of reducing the burden of disease through effective interventions, health professionals must be able to collect and analyse pertinent data to make rational decisions between alternatives in the planning of services that are hedged with constraints. Considerable attention is paid to this in the COME programme.

Materials are prepared based on a three dimensional set of principles (Figure 2).

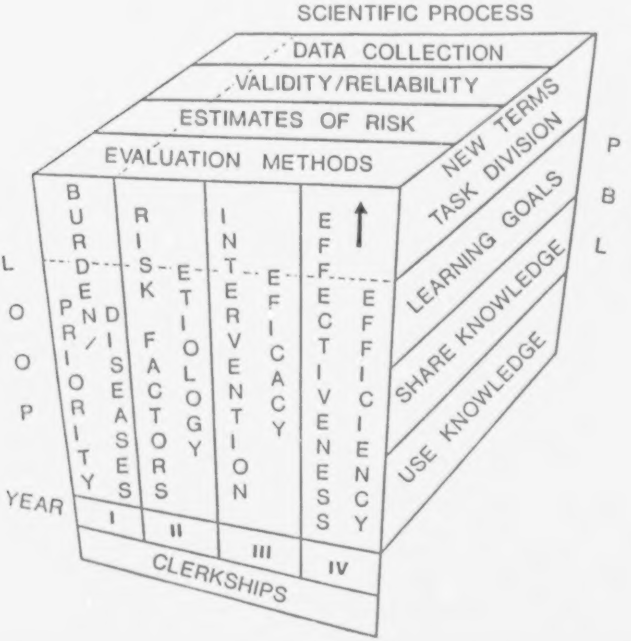
SCIENTIFIC PROCESS
DATA COLLECTION
VALIDITY/RELIABILITY
ESTIMATES OF RISK
EVALUATION METHODS
NEW TERMS
TASK DIVISION
LEARNING GOALS
SHARE KNOWLEDGE
USE KNOWLEDGE
PBL
LOOP
BURDEN/PRIORITY
DISEASES
RISK FACTORS
ETIOLOGY
INTERVENTION
EFFICACY
EFFECTIVENESS
EFFICIENCY
YEAR
I
II
III
IV
CLERKSHIPS

Figure 2. The three-dimensional learning matrix

The top of the cube is based on the "scientific method" dimension: 1) methods of data collection; 2) validity and reliability: aspects of bias in research/routine data; 3) interpretation of estimates of risk (use of data), and 4) principles of evaluation: input - process - output.

The side of the cube shows the learning/problem-solving cycle in small groups used for all learning activities: 1) identify new terms and concepts - divide the tasks; 2) define the problem and identify new learning goals; 3) share the new knowledge in detail and apply it to the problem, and 4) use the knowledge - translate the theory into practical application.

In the first year an introduction is given on the use of the library.

The front of the cube is derived from the simplified iterative loop (Figure 1): 1) determining priority diseases in the community; 2) identifying important risk factors of groups at high risk; 3) selecting efficacious interventions, and 4) planning effective/efficient health service programmes and information systems.

The programme is not static, and fieldwork is organised differently for different cycles of students. Initially it was conducted in alternate semesters, but at present field activities are mixed with classroom activities throughout, rather like the integration of skills in clinical teaching. The first three semesters cover basic knowledge and appropriate ways of data collection. The last group sessions of the third semester (Year II) are used to develop a proposal for implementation in the field (POA= Plan of Action). In the third year risk factors are emphasized, and in the fourth year the choice and evaluation of an intervention. Students progress from second hand data to data collection in the field. During field work student groups go back to the same health centres, and the information generated is presented to the health centre staff. In later years there is specific instruction in how to critically appraise the research methods in published articles (Hakimi, 1988).

During the clerkship students are split into pairs and spend 4 weeks in a health centre concentrating on the management and evaluation of a programme.

Choice of Materials to be Included

The materials consist of a reader and manuals. The reader for the entire four year period covers the underlying theories needed for the three dimensions. This volume is revised annually. In the semester manuals a problem is presented, and some direction is given to reading materials for learning or problem solving. In the early years there is more learning from - later more *solving of* problems.

Too broad a range in 1986/1987 led to overload of the programme. Too narrow a range would not fulfil the objectives. In order to determine the knowledge base deemed necessary, senior Faculty members were interviewed about what they thought the students should know at the time of graduation with regard to the pathology, clinical management and epidemiology of a number of priority diseases. The results (Sanusi, 1987) were disappointing. The information was used, however, and some agreement was reached between tutors on the choice of topics and expected learning goals. These were used for the construction of problems. A new set of topics is used each year, so that a bank of problems for self-directed study will be built up (Table II).

Table I. Semester list of activities in PBL

Week	Activity	Remarks
I	Introduction to group-based learning Introduction to the library	First year only
	Analysis of scenario	Other years
II	Analysis of scenario	All years
III	Analysis of article	
IV	Choose articles appropriate to topic	Task division within groups
V - X	Analyse reading matter	Difficulty depends on year
XI	Propose activities for fieldwork	Depends on cycle/year
XII	Consider pathobiological/social effects of activities. How would you carry out proposed activities?	
XIII	Make an implementation plan	
XIV	Other aspects about the topic that should be considered: divide tasks, hand in individual reports to tutor	Mark given
XV	Closing: review learning and group process of this semester	Evaluation report

After two terms there is an end-of-year examination.

Table II. Priority problems

Sem.	Dimension	1985/86	1986/87	1987/88	1988/89	1989/90
I	Burden	IMR/Diarrhoea (Acute) natural history	IMR/Diarrhoea	Intestinal worms	Drugdependence	Introduction
II	State of health	Survey	Survey	* Use survey instrument (Size of uterus)	Class work	Mother and child health
III	Risk	Tuberculosis (Chronic)	Tuberculosis (Measurement)	Tuberculosis	Hepatitis B Primary prevention	Programme
IV	Risk factors	Survey	Survey	* Survey	Survey	Family planning
V	Intervention	Malaria	Vitamin A deficiency	Diarrhoea	Hypertension Secondary prevention	Diarrhoea control programme
VI	Implement plan in health centre			*		
VII	Evaluation	Sore throat (Clinical Epidemiology)	Malaria	Measles (Immunisation)	Gonorrhoea Tertiary prevention	Accident and poison service
VIII	Evaluation Service	Dx/Rx, referral	Health centre disease management	*		Nutrition programme

Clinical years experience in health centre: Evaluate a programme; make a plan.

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* Interview technique before field work in each even semester.

Problems

Students

'Social loafing' (poor participation in group work) has been a prominent problem. A blanket grading system led to complaints from both students and tutors and appeared to aggravate this situation. Opportunities to carry out an additional project to obtain a higher mark did not, however, abolish it. Loading groups more heavily and dividing tasks very specifically between members appears to have resulted in better cooperation within groups. End of block tests and a semester examination were reintroduced. Reduction in 'social loafing' was related to better results in the tests, tentatively confirming research done elsewhere (Sanusi, 1986). There is a feeling amongs the staff that high school students are not yet ready for group discussions of this type. This has not been tested.

Staff

Staff problems appear to be related to time and the uncertainty factor. A larger number of hours is required to conduct small group learning sessions with a large body of students, than to give lectures. Moreover, it takes more time to produce good integrated learning packages with different topics incorporating the set objectives and integrating different disciplines, than to produce a lecture on a single subject. This competes with the staff's own priorities.

The uncertainty factor particularly influences the behaviour of tutors. In a student-centred system the main task of the tutors is to see that learning takes place and that the general direction is in accordance with the objectives. They themselves do not have to be an expert resource for the knowledge to be acquired. Staff are not used to approach their daily tasks in this way. In clinical encounters and in unidirectional teaching doctors are considered to be fully conversant with their material. This was also a problem for some tutors in the multidisciplinary block system of the period before 1985. In addition, the attitude to scientific enquiry is often weak. This means that the new method is threatening. The concentration on the group process during tutor/student contact is far more intense than during lectures. It demands interpersonal skills that some lecturers find uncomfortable. This, in turn, can lead to a reversion to mini-lectures, or even to opting-out with plausible rationalisation.

Workshops have been held repeatedly to introduce methods of module production and tutoring. There is a high level of motivation in a considerable number of senior Faculty members, who attend enthusiastically and frequently more than once. There is thus a felt need for repetition.

Materials

Stocking the library with learning materials, multiple copies of books and articles, requires financial resources not available locally. Library development as a whole is woefully deficient for structural reasons. Librarians are rare indeed.

Improving skills training will be aided by the establishment of a modest skills laboratory based primarily on available resources, which will not be sufficient. Staff for this facility are being trained, but more will be required.

Evaluation

There is as yet no Department of Education Research in the Faculty; ordinary doctors and basic scientists have to evaluate innovations themselves and they feel that this is not their task. The general reward system concentrates on the scientific discipline to which staff belong, and innovation in teaching is felt to be less well rewarded. Young staff still need to be trained and this needs to be done outside Indonesia.

At the end of 1988 a workshop was held to familiarise staff with ways in which they themselves can evaluate innovations in teaching strategies. A number of proposals are currently being developed. The participants came from GMU and also from other institutions (Soenarto, 1989).

Conclusion

Despite the absence of formal internships and general practice training, the Medical Faculties in Indonesia are expected to produce safe medical practitioners for peripheral primary and secondary health care. At the same time universities have the responsibility to produce future medical scientists.

The innovations at GMU are a step towards both. More attention is paid to methods of scientific research than in the traditional curriculum. Also the practical application of the basic principles of biomedical knowledge to problems of prevention and treatment is expected to result in better health care and management immediately after graduation than with the traditional curriculum.

The staff require assistance in understanding the importance of methods of data collection both for patient care and the planning of more effective services. Little use is made of their own secondary data. Use of data by health service personnel is generally weak, hospital doctors being no exception. The educational process is far from complete. There is a need to develop more integrated learning problems in COME. Integration of lectures in the rest of the curriculum, where small group learning is still too labour intensive, has yet to start.

There has been a great change in the attitude of many staff members and their motivation for innovation. It is not carried by the foreign agencies, but by the Faculty itself. Certainly this has been aided by input from outside in the form of workshops in Indonesia and training overseas, which will need to continue for some time to come. Everyone is convinced that further changes and revisions need to be carried out. The innovations that have taken place at GMU may not appear very extensive to an outsider, but critics would do well to compare changes at GMU with those in conservative schools in developed countries: they will see that, considering the means available, progress compares well. This process can no longer be arrested. With assistance it will proceed faster.

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Village Studies: An Introduction to Community Health for First-Year Medical Students

John P. Musgrove and Simon J. Carson
Sultan Qaboos University
Sultanate of Oman

Abstract

Each year of medical students at Sultan Qaboos University in the Sultanate of Oman are identified with a particular village which is easily accessible from the University. It is planned that students will make repeated visits to "their" village throughout the seven years of their medical course, using it as a "living laboratory" but also contributing to the improvement of health in the community.

This chapter deals with the community studies organised by the Department of Family and Community Health in two villages for the first two classes of students who entered the College of Medicine in 1986 and 1987 respectively. The studies focuseb on trachoma which is a major health problem in Oman.

Introduction

The Sultanate of Oman is a Muslim country situated on the south-east margin of the Arabian Peninsula where it is strategically placed to guard the entrance to the Arabian Gulf at the Straits of Hormuz. It has an area of 272,000 square kilometres and a population of about 1.75 million. There are two main areas of population - the Muscat area and the Batinah coast in the north, and Salalah with its surrounding area in the south. While many areas have been developed for agriculture with complex irrigation systems, a large part of the country is desert or semi-desert inhabited by beduins. It is in this desert area that the main reserves of oil are found (Whelan, 1984).

Oil is the source of Oman's wealth, but great efforts have been made to diversify exports to include agricultural and fishery products. Under the guidance of His Majesty Sultan Qaboos bin Said, the country has developed into a modern state with health care and education facilities in most towns and villages.

In 1982 it was decided that a university should be developed to help meet the needs

Requests for reprints should be sent to John P. Musgrove, 6 Stratford St., Christchurch, New Zealand.

of the country for trained professional scientists, engineers, agriculturists, teachers and doctors. Sultan Qaboos University opened in September 1986 with five hundred students. In 1990 the student numbers are two and a half thousand. The College of Medicine admitted just over fifty students for each of the first three years, but the fourth intake is seventy-six. This is made up of almost equal numbers of men and women.

The aim of the College of Medicine is to produce appropriately trained graduates. While there is a need for specialists there is an even greater need for well-trained primary care doctors who are community-oriented and able to provide personal service for patients and meet community health needs. Students are introduced to community work early in their course. We want to make them aware of community problems and also to use them as health workers in a country where health workers are in very short supply. With this experience students will improve their communication and relationship-building skills and develop some specific clinical skills. They have different types of community experience in each year of their course in an effort to orientate them towards a medical vocation in primary care to meet the country's needs.

The medical course is of seven years duration, and student entry is based on marks obtained in the school-leaving examinations. There are no student interviews. In the first two years, basic sciences are taught - Biology, Chemistry, Physics and Mathematics - with considerable emphasis on English. At the end of this part of the course the students should be at an English A-level standard. In the third and fourth years, basic medical sciences are studied, and after four years a bachelor's degree is awarded. Clinical studies are completed in the final three years of the course and are followed by an Internship year before graduates will be registered.

Programme Organisation

During the first year of their course, there is no time available for community studies. The programme is organised during the first two weeks of the summer vacation, after their second semester examinations . The course consists of making a census of a village, completing a household health questionnaire, studying the immunisation status of children under the age of two and the prevalence of trachoma in the village. The classroom teaching takes place over three days and is run by the Department of Family and Community Health, together with staff of the National Health Programme (NHP) of the Ministry of Health who are responsible for the Extended Programme of Immunisation (EPI) and the Prevention of Blindness Programme (PBP) in Oman. Students are taught:

- Basic principles of epidemiology and surveying techniques;
- How to record a family census;
- What diseases children are immunised against and why;
- How to record a child's immunisation status using the EPI immunisation card;
- How to complete a household health questionnaire;
- Prevention of Blindness screening procedures;
- The anatomy of the eye;
- Vision testing;
- How to recognise squint, conjunctivitis, corneal opacities, scars and ulcers, foreign bodies in the eye, cataract, raised intraocular pressure, trichiasis, and trachoma;
- How to record eye examinations;
- When and how to treat or refer detected eye problems;
- How to enter data into an IBM PC computer using a Dbase III-plus programme.

The greater part of the teaching programme is concerned with eye problems, and emphasis is placed on trachoma (Anon, 1981). The teaching programme for eye diseases is based on the manual used by the Prevention of Blindness Programme of the Ministry of Health. The diagnostic scheme uses a modification of the 1981 WHO grading (Darougar, 1983).

The classroom teaching about eyes takes two days with a further half day to cover the other topics listed above. 35 mm slides are used to illustrate the various grades of trachoma. Students are taught how to examine eyes and practise on each other. There is particular emphasis on everting the upper eyelid and on instructing patients how to apply eye ointment. The students are then divided into groups of four (two male and two female students), and each group is allocated one staff member as a supervisor. The supervisors, who attend all the teaching sessions, are drawn from the NHP, various departments of the College of Medicine (Family and Community Health, Anatomy, Behavioural Science) and nurses from the University Hospital. Each group is paired with another, and a day is devoted to role playing. One group acts as a family in the village and the other is required to go through an entire family contact, recording the findings and giving health education advice while being observed by the supervisors. Each group plays each role several times in the day. The procedural problems are thus largely ironed out before the students actually start in the field.

Before the students visit the village, it is necessary to visit the wali (governor) of the area to obtain his permission and cooperation. He informs the local sheikhs who, in turn, inform the villagers. The villages are chosen because they have inadequate health care and sanitary facilities or their inhabitants are mainly in the lower income groups. It is in these villages that trachoma is likely to be more prevalent and, therefore, provide students with good clinical material. The University is also interested to improve facilities in such villages.

These locations have to be within fifty minutes drive from the University, so that students can visit for half a day, leaving the University at 8.00 a.m. and returning at 1.00 p.m. It would not be possible to provide accommodation for a group of over fifty male and female students in a village. The villages do not have any form of house numbering as yet. With the cooperation of the NHP personnel a map is therefore drawn in which every house is identified. Each team is provided with a copy of the map.

The work in the village is an extension of the learning process, and the students improve their skills of examination and recording. The groups work under their own supervisors, some of whom are very experienced PBP workers. Students' performance is monitored by ophthalmologists who are constantly moving between the teams, usually two ophthalmologists for twelve teams of students. By the end of their time in the village, the students are very competent in examining, treating and giving advice about eyes. They will have performed a census of the village which has usually not been achieved before. They have good insight into the efficiency of the EPI programme and understand the state of health and sanitation problems of the village. The fieldwork is carried out during the mornings only, because at that time of the year the midday temperature is between 40 and 50 °C. Most houses have no air-conditioning, and examinations are usually performed on roofed terraces. On occasion there is some difficulty with goats and sheep wandering through the examination area. Families are large in Oman, because there is a high fertility rate, 7.1% in 1987 (Grant, 1989), and infant mortality has dropped dramatically, from 214/1000 in 1960 to 45 in 1987 (Ministry of Health, 1987). Frequently neighbouring families visit while students are in the houses. This increases the noise, movement and difficulties of sorting and examining people by the students. In the afternoon the students enter the data into Dbase III-plus programmes on IBM PC XT computers; one computer is available for each team. The programmes have been specially designed for the purpose by members of the staff of the Department of Family and Community Health and the Computer Centre of the University. The data is subsequently used as resource material for the students' biostatistics course during the following year.

Discussion

To orientate students and make them aware of health problems in the community, the Department of Family and Community Health contributes to the curriculum from the first year of the course. In the first semester students are introduced to community health care facilities. This series of visits is largely a passive experience for the students. The vacation course described above is an effective way of initiating their active involvement in the community's health. Trachoma is a useful model on which to base such a study. The students learn early in their course about a major health problem and develop skills required for the diagnosis, treatment and prevention of the problem. They learn that a short and intensive training course can equip them to function as health workers in a country where there is a shortage of such workers. They learn that giving effective health education will be one of the most important aspects of their work throughout their medical career. They learn to work in mixed groups, to develop their communication skills and experience the difficulties of examining children. They also see that other health professionals can be more useful than doctors in some areas of health care.

Another aspect of the study which we consider important is the establishment of a good working relationship between the Ministry of Health and the University through the exchange of information and expertise.

We have recently tried to evaluate the accuracy of the work by having an ophthalmologist check the students' diagnoses randomly. This has shown that there is a tendency for students to overdiagnose trachoma. There is also quite a variation in the accuracy of diagnosing between the various groups which may be influenced by the experience of the supervisors. This evaluation has lead to modifications of the teaching programme and providing supervisors with extra seminar and discussion sessions.

When we started the programme with the first class of students, the main difficulties were related to working in mixed groups. Students had never worked in this way before but gradually accepted the necessity of mixed groups when visiting village houses. Subsequent classes have found this aspect much easier and have enjoyed the experience. There was doubt whether the villagers would cooperate with the programme which involved having numbers sprayed on their walls, as well as being examined by students. These doubts have been largely groundless. The Omani people, who are warm, friendly and courteous by nature, have welcomed the students and have been very hospitable to them. There have been no difficulties with students visiting the village in subsequent years.

We hope that, by focusing on particular villages, we may come to understand community health problems better. Students, who have been involved in the programme, and their supervisors, who are predominantly expatriates, have a much better understanding of the life style of people in disadvantaged villages. This will help them to be more realistic in their expectations of such patients in their teaching and in their provision of health care. We hope that such field studies will produce valid epidemiological data for Oman and help, indirectly, to improve the health of the villagers.

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Centre for Clinical Epidemiology and Biostatistics, University of Newcastle

R.F. Heller

The Centre for Clinical Epidemiology and Biostatistics is located in the Faculty of Medicine, the University of Newcastle, New South Wales, Australia. We act as one of five training centres in the International Clinical Epidemiology Network (INCLEN) and also have funding from the Federal Government of Australia. Our teaching role concentrates on the postgraduate training of clinicians and other health professionals in the fields of epidemiology, biostatistics, clinical economics and health social science. More recently we have added strands in pharmaco-epidemiology, health promotion and social psychiatry.

Course work occupies one academic year and includes the fundamental principles of the subjects listed above and various specialty options. The last three months of the course involve the development of a detailed research protocol. The research itself is then carried out in the next year(s), usually back in the students' home environment. Faculty members from the Centre provide follow-up during subsequent years. For students who are part of the INCLEN programme this includes an annual visit to them to help with any aspects of their on-going research or their own teaching programme. Satisfactory completion of the course work component provides a Postgraduate Diploma, and a Masters degree is awarded on submission of an adequate thesis based on completed research.

Many important research studies have been completed which have had an impact on health policy. The INCLEN programme includes training centres at McMaster and Toronto Universities in Canada and the Universities of Pennsylvania and North Carolina in the United States of America, as well as 26 units in the developing world.

The author is the Director, Centre for Clinical Epidemiology and Biostatistics, University of Newcastle, David Maddison Clinical Sciences Building, Royal Newcastle Hospital, Newcastle NSW 2300, Australia.

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FROM NON-MEMBER INSTITUTIONS

The Mindanao State University College of Medicine Community-Based Medical Curriculum

Angelo H. Manalo
Mindanao State University
Marawi City, The Philippines

Abstract

This paper describes the nature, location and duration of the community-oriented part of the undergraduate medical course of the Mindanao State University. The five Family and Community Health segments, spread over the three years, and the fourth year clerkship are discussed.

The Mindanao State University (MSU), as the premier government educational institution in the island of Mindanao in the Southern Philippines, is responsible for the development of medical manpower to meet the needs of medically underserviced areas of the region.

Vision, Goals and Objectives

1) To provide competent medical practitioners for the underserviced areas of the MINSUPALA (Mindanao-Sulu-Palawan) region.
2) To build a centre for medical education and research whose output will be primarily geared towards the development and improvement of the standards of medical care in the MINSUPALA region.
3) To develop a network of medical and health care delivery systems in the MINSUPALA region in cooperation with the Department of Health and other agencies.
4) To provide the opportunities for Muslim students and other members of the MINSUPALA communities, as well as poor but deserving students of the region, to

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Request for reprints should be sent to Angelo H. Manalo, Mindanao State University, College of Medicine, Marawi City, The Philippines.

become physicians and serve the areas from which they come

To this end the medical school has embarked on an innovative curriculum where community-based experience and exposure is given as much, if not more, weight than hospital-based experience.

As the basic and clinical subjects of the curriculum are similar in content to those of other medical schools, attention is focused on the Family and Community Health courses which form the core of our community-based curriculum. Other courses will be mentioned where they relate to the Community Health courses.

Course on Family and Community Health

1) Family and Community Health I

1st year, 1st semester, 34 hours.

- mainly classroom work with occasional field trips and seminar-workshops.

Topics:

National and local health situation; evolution and concept of family and community medicine; primary health care concepts and principles; the Philippino family; self-awareness and value formation; traditional concepts of health and illnesses in The Philippines; team building; medical anthropology and sociology.

2) Family and Community Health II

1st year, 2nd semester, 255 hours.

- initially classroom work with lectures, workshops, group discussions, problem-solving exercises;
- later work is mainly community-based with students assigned to individual families and groups of students to a community.

Topics:

Public health principles; biostatistics; research methods; field epidemiology; approaches to disease control: a) communicable diseases, b) non-communicable diseases; first aid; maternal and child health; community nutrition; community mental health; environmental and occupational health; teaching, learning and communication skills; community diagnosis and management; community organising; community social investigation.

3) Family and Community Health III

2nd year, 1st semester, 255 hours.

- mainly community work with some classroom lectures and demonstrations.

Topics and activities:

Folk medicine: introduction to history taking and physical diagnosis; community activities: a) implementation of action plans arrived at during community diagnosis in Family and Community Health II; b) continuation of student-family interaction regarding health care and possibly socio-economic problems; c) establishment and manning of a health care centre in cooperation with the Department of Health Personnel and other health workers, social workers, civic organisations and community members to serve local and adjoining communities. Team approach is to be used, with the government District Hospital and Faculty members to serve as referral facilities. Problem-based learning is the main teaching tool. Senior students rotating through the same health centres will also serve as senior supervisors. Free use of the medical school library facilities is also encouraged.

4) Family and Community Medicine IV

2nd year, 2nd semester, 51 hours.

- mainly didactic, with some field trips and workshops.

Topics:

Agri-industrial and plantation medicine; basic clinic and hospital administration.

Other activities:

Groups of students are assigned by rotation to continue manning health centres, as during Family and Community Health III, on a twice weekly basis. This is to be done during the Medicine I (physical diagnosis) period. The main group of students stay in the hospital, while a small group goes to the community health centre to continue activities in preventive, promotive and curative care. Students, in their own time, are required to visit their assigned families on a weekly basis to continue their interaction and check on their progress. Progress reports are made to preceptors at intervals.

5) Family and Community Health V

3rd year, 1st semester, 68 hours.

- mainly in the community, seminars and classes on primary health care activities, including training of health workers;
- implementation of action plans and student-family interaction continues.

Other activities:

The community health centre is manned on a twice weekly basis by small groups of students rotating during their assignment in Internal Medicine in the base hospital.

A Faculty member or Department of Health doctor will supervise them periodically at the clinic.

6) 3rd year, 2nd semester

There is no formal family and community health course, but the Community Health Centre activities continue with students during their Internal Medicine rotation at the base hospital. Students, in their own time, continue to visit their assigned families at least once a week and report at the end of the semester. This is a prerequisite for their Community Medicine Clerkship.

7) Clerkship in Community Medicine

4th year, 12 weeks.

Activities:

Implementation of action plans - left unfinished in their previously assigned villages; staffing of community health centres, working as a team with other health workers rendering domiciliary care and other primary health care activities; clerks also go "on duty" sleeping in the community to respond to any medical emergency, including home obstetric deliveries. Other clerks are rotated to other communities assigned to junior students to help man the community health centres and to go on "night duty". They also teach and supervise the junior students. Towards the end of their rotation, clerks make an evaluation of the community, based on parameters they adopted during their 1st year, and to see if the health of the community improved during their 4-year stay in the community. Their analyses will then be used by the incoming first year students to continue the work that they may have left unfinished. If the community can be left alone to look after its own health needs, then a new batch of students will no longer be assigned to it. However, 3rd and 4th year students will still be rotated to the community health centres.

At the end of this medical course, the graduate is expected to have a sound background in the actual state of health of the people in his area, the type of health care delivery system available, the prevalent ailments and management. He will also be a competent community organiser and catalyst in community activities and able to establish a health care system in a community using the primary health care approach and be a part of a health team delivering promotive, preventive, curative and rehabilitative services to the community.

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The Area Health Education Center: A Model of Community-Based Health Sciences Education

Daniel S. Blumenthal
Morehouse School of Medicine
Atlanta, Georgia, United States of America

Abstract

The Area Health Education Center (AHEC) programme is a model of community-based education which has been used widely in the United States, but apparently not in other countries. This paper describes the general model, provides some detail about one representative programme and discusses aspects of the programme which make it attractive as a mechanism for increasing health manpower in underserved communities.

Community-based medical schools have pursued a variety of models in attempting to offer their students community-relevant educational experiences (e.g. Margolis et al., 1987; Rabinowitz, 1988; Ruane, 1988, and Verby, 1988). This paper describes the AHEC model for community-based health sciences education and provides some detail concerning the Morehouse School of Medicine AHEC Programme.

Background

AHEC programmes attempt to improve health care in medically underserved rural and inner-city communities by preparing students to work in these communities and by supporting professionals who are already practising there. It offers education and training at both the undergraduate, postgraduate, and continuing education levels. The AHEC model was one of several reforms recommended 20 years ago in a Carnegie Commission report (Kerr et al., 1970). The report proposed that a nation-wide system of AHECs be established, in order to organise regionalised health sciences education under the aegis of academic medical centres. AHECs would also

Requests for reprints should be sent to Daniel S. Blumethal, Morehouse School of Medicine, Department of Community Health and Preventive Medicine, 720 Westview Drive, S.W., Atlanta, Georgia 30310-1495, United States of America.

support and develop primary care postgraduate training, develop educational programmes for allied health professions, and enhance the professional practice environment in underserved areas. Federal funding for AHEC programmes began in 1971. There are currently AHEC programmes in 32 states which receive or have received Federal grants; 43 medical schools and 5 osteopathic schools are involved. Many AHEC programmes are vigorous and play an important role in the educational programme of the sponsoring medical school; some are vestigial.

The Model

The AHEC model includes an academic and a community component. The academic component is led by a medical school which includes other health sciences schools and houses the administration of the AHEC programme. Ideally, clerkships and other practical experiences, organised through the AHEC programme, are interdisciplinary in nature.

The community component consists of one or more Area Health Education Centers, or AHECs, which together with the academic component constitute the "AHEC Programme". The AHEC is a community entity which is organisationally and legally separate from the health sciences centre and operates under the aegis of its own board of directors. The AHEC is typically a coalition of one or more community hospitals, primary care centres, health departments, nursing homes, private physicians, and other providers located within the centre's geographically defined catchment area. The coalition frequently includes local colleges which offer health sciences training programmes. The board of directors may consist of a representative from each of the institutional members of the coalition. The centre has its own executive director and administrative staff.

The medical school contracts with, and pays the AHEC to carry out certain activities, including:

- identification of community sites for medical student clerkships and practical experiences for other health science students. Federally-funded AHEC programmes must insure that medical students from the sponsoring school receive at least 10% of their clinical education at AHEC sites.
- organisation and sponsorship of primary care postgraduate programmes for physicians.
- sponsorship of continuing education for community practitioners.
- maintenance of a learning resources centre, or library for the use of students, residents and community professionals.

In addition to these core activities, the AHEC may engage in other activities important to the community, including the recruitment of health personnel, the recruitment of secondary school students (especially minorities) into health careers, and the provision of health promotion and education services to the community at large.

The supervision of students is shared by community professionals and full-time Faculty members from the academic health sciences centre. Full-time Faculty members may visit only periodically to ensure the quality of the educational experience. They also serve frequently as lecturers in the continuing education programmes. The AHEC may reimburse the health sciences centre for the "use" of its staff members. Figure 1 illustrates the relationships between the AHEC and the health.

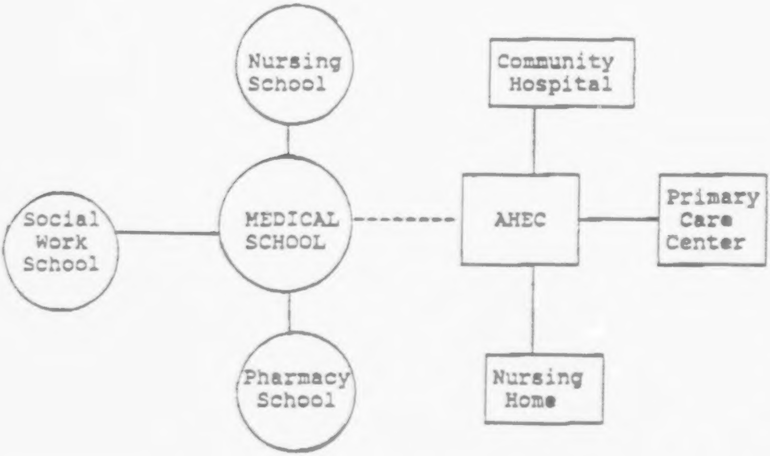
Nursing School
Community Hospital
Social Work School
MEDICAL SCHOOL
AHEC
Primary Care Center
Pharmacy School
Nursing Home

Figure 1. Relationship between the Area Health Education Centre (AHEC) and the Academic Health Sciences Centre

The Morehouse School of Medicine Programme

The Morehouse School of Medicine is a new medical school. Its first students were admitted in 1978. It is one of four medical schools in the USA (out of a total of 126) which are primarily devoted to producing black physicians. Its mission is to train primary care physicians to practice in medically underserved rural and inner-city communities, especially minority communities. The goals of the AHEC programme and of the medical school are therefore mutually supportive. The Morehouse AHEC Programme is a fairly representative programme. However, it is distinguished from many others by its emphasis on training and serving minorities and by the fact that the states it serves - Georgia and Alabama - are two of the poorest in the USA.

Morehouse is not part of a university health sciences centre; it has instead developed a consortium of like-minded health sciences schools, including two other predominantly black schools: Morris-Brown College (Department of Nursing) and Clark-Atlanta University (Schools of Social Work and Allied Health Sciences). In addition, the consortium includes three other schools of nursing and two schools of pharmacy.

The programme includes three AHECs: an urban centre, the Atlanta AHEC, and two rural centres. The urban centre is responsible for placing students in health care facilities in inner-city Atlanta and for providing continuing education for professionals practising primary care in these areas. Although Atlanta has a large number of physicians and other health professionals, these are unevenly distributed and practise primarily in the wealthy areas of the city. Approximately 25% of the city's 400,000 residents live in communities which are badly underserved by USA standards. The only sources of primary care for about half of these individuals are two Federally funded community health centres. These centres serve as AHEC teaching sites, as do county health department clinics, a community nursing home, a small community hospital, and a variety of other facilities. Some of these institutions are staffed by volunteers and part-time professionals. The Atlanta AHEC also devotes considerable attention to the recruitment of minorities into the health professions and to this end sponsors many workshops and other activities for inner-city secondary school students.

One rural AHEC targets the south eastern quadrant of the state of Georgia, an area of approximately 19,000 square miles with a population of about 600,000. The other AHEC serves a 20,000 square miles catchment area which spans the state of Alabama in an east-west direction and covers about one fourth of the length of the state. The population of the area is approximately 750,000. Health professionals working in these areas are located at a great distance from the academic medical centres and are at risk of professional isolation, stagnation and obsolescens. Therefore, in addition to identifying rural sites for student clerkships and practical experiences, these AHECs focus on the sponsorship of conferences and other continuing education activities. Each AHEC offers approximately 120 conferences annually; these have a combined attendance of about 6,000.

Morehouse medical students receive approximately 20% of their clinical education at AHEC sites. In addition, the Atlanta AHEC annually places students of other health professions for practical experience.

Discussion

The AHEC model offers a unique set of challenges and opportunities in developing a programme of community-based health sciences education. An apparent disadvantage of the model is that the programme must be negotiated with the community on a continuous basis, and the priorities of the community may not always match those of the medical school. For instance, the medical school may assign its priority to the training of medical students, while the community may view the training and recruitment of nurses as a higher priority, or it may view the provision of continuing education as an even higher priority.

However, the assumption of this pre-eminent role by the community is not necessarily an obstacle to the development of an educational programme. Indeed, the reverse may be true. Community health care institutions often fear that they will be dominated or absorbed by the academic medical centre if they agree to become a part of its teaching programme. Rural professionals may have values which are different from those of university academics and may feel threatened by the prospect of being used as a "teaching laboratory" by the academic centre. The cooperation of these institutions and professionals frequently depends on assuring them that they will maintain control, including control of programme priorities, policies and procedures at the local level.

The AHEC model has the potential of making a significant impact on the geographical distribution of health care professionals. Studies of the factors influencing physicians' choice of practice location have produced conflicting results (Burke et al., 1979; Chaulk et al., 1987, and Steinwald et al., 1975). However, it does seem unlikely that merely assigning a reluctant student to a rural community for part of his education will influence him to spend the rest of his life in a similar community. It may be necessary to make some changes in the community, as well as in the student. The AHEC model helps make the community more attractive to the professional because it transfers a small part of the academic medical centre to the community. By providing visiting academics, professional conferences, access to library resources and the opportunity to teach, the programme helps to relieve the sense of professional isolation. In fact, this hypothesis has been borne out in AHEC programmes which have existed long enough to test it. For example, the North Carolina programme, which was started in 1971, has shown a rate of increase in its rural physician-to-population ratio substantially in excess of that of the rest of the USA.

Despite numerous AHEC programmes in the USA and some evidence of success of the model, it has not, to our knowledge, been employed in a developing country. With appropriate modifications to suit local conditions, it would seem to offer considerable potential.

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Health of the Public at Columbia: The First Year

Oliver T. Fein, Allan Rosenfield and Michael Vicinanza
Columbia University
New York, NY, United States of America

Abstract

The author describes how one medical school has implemented a nationwide programme to stimulate change towards population-based science and response to the needs of the population in the United States of America.

Definition

Health of the Public [i] at Columbia University is a programme designed to establish a continuum of public health education in the dental, medical and nursing schools of the academic medical centre. The programme starts before professional school education begins, continues in the pre-clinical and clinical years and concludes in the postgraduate years. The overall goal is to create interdisciplinary educational interventions that: 1) nurture the social instincts that attract many students into the health professions, and 2) foster career pathways that combine clinical and public health activities. Ultimately, we propose to develop a "clinical public health track" in each of the three professional schools - dental, medical and nursing.

What is clinical public health? It is commonly thought that clinical activity and public health activity are at opposite ends of a spectrum. For the clinician, the individual is paramount; for the public health practitioner, populations are the focus.

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[i] Health of the Public Programme. This is a nationwide programme, sponsored by the Pew Charitable Trusts and the Rockefeller Foundation, to stimulate institutional change towards population-based science and public responsiveness in academic medical centres within the United States. Six grantee institutions were funded at the outset. The national office is located at 735 Parnassus Avenue, University of California, San Francisco, CA 94143-0994.

Requests for reprints should be sent to Oliver Fein, Columbia University School of Public Health, 600 West 168 Street, 7th floor, New York, NY 10032, United States of America.

How can these polar perspectives be combined? Health of the Public at Columbia began by debating this issue. One point of view tries to integrate the individual and population-based perspectives by viewing clinical care for individual patients as but one factor influencing the health of populations. Health professionals interested in improving community health status become involved in various, mutually supportive combinations of clinical, research and administrative activities. In each of these areas, the focus is sometimes on individual patients, sometimes on small groups and sometimes on large populations. According to this traditional point of view the construct "clinical public health" was developed to provide a frame of reference for understanding this complex, multifaceted approach (Table I).

Table I. Clinical public health: A definition

Professional Activities	Level of focus Population Groups	<———>	Individual Patients
Clinical Care	Primary Prevention	Secondary Prevention	Treatment ("Tertiary Prevention")
Research	Epidemiological Research	Behavioural Research	Health Services Research
Administration	Governmental & Voluntary Agencies	Community-oriented Primary Care, Occupational Health, etc.	Hospitals, long-term care facilities, etc.

F.S.

The other point of view regards the tension between individual and population perspectives as inevitable. Those holding this dialectical point of view feel that the major activities of health professionals (clinical care, research, teaching and administration) may conflict with each other. These tensions do not yield combinations of clinical care, research and teaching that are mutually reinforcing but rather may result in compromises both within individuals and institutions that leave one perspective dominant. From this point of view, the goal of identifying clinical public health as a separate entity is to acknowledge contradictions and to encourage health professionals to develop careers that incorporate the tension between the individual and population-based perspectives.

In this era of increasing subspecialisation, most students get the message that you must be one or the other: clinician or public health practitioner. Whatever the point of view, one goal of Health of the Public at Columbia is to develop educational interventions that challenge this reductionistic approach and that project role models of Faculty staff who are attempting to combine the clinical with a population-based perspective, keeping both perspectives alive.

The Challenge at Columbia

Another goal of Health of the Public at Columbia, is to help the Columbia Presbyterian Medical Center (CPMC) to meet the challenge posed by the needs of its surrounding community. CPMC is located in an ethnically diverse and economically disadvantaged community. It faces a strong challenge to its ability to maintain its leadership in academic medicine and to be responsive to the social and economic realities of its neighbourhood. Washington Heights - Inwood, the neighbourhood surrounding CPMC, is inhabited by approximately 180,000 persons, according to the 1980 census. The population has, if anything, grown since that time. It is a diverse ethnic community. Many of the newest residents live at, or below, the poverty line and are undocumented residents. According to the census, 28% of the population is white, 14% black, 54% hispanic and 4% other. The Spanish language population is three times as high as the city-wide average. The demography of the area is unique in many respects. For example, 60% of the residents are of foreign stock compared to 36% for the remainder of Manhattan and 41% for the rest of the City.

There are concentrations of Dominicans (59% of the documented Manhattan Dominicans reside in Washington Heights - Inwood although they account for only 13% of the borough' population), Cubans (9% compared to 2% in Manhattan), German (8% compared to 2% in Manhattan) and Irish (7% compared to 2% in Manhattan).

During the last decade the Washington Heights - Inwood community has witnessed the closing of five community hospitals representing over 1,136 beds. Presbyterian Hospital has become the *de facto* public hospital for Northern Manhattan. Its role as primary provider has increased still further due to the aging of the primary care community-based physicians (median age 61). There has been an increase in Medicaid [i] admissions to CPMC from 13% in 1981 to over 28% today, the largest for any academic health centre in New York City. Over 80% of current ambulatory visits are by low income, predominantly Hispanic patients, many of whom are medically indigent [ii]. Community indicators show Washington Heights - Inwood to be considerably poorer than the city-wide average in terms of median family income and proportion receiving income support.

If Washington Heights - Inwood is poor compared to the rest of the city, the Harlem Community located just to the south and east is even worse off. New York City Department of Health statistics repeatedly indicate that Central Harlem has the highest death rates for virtually all categories of diseases. For example, in 1984, Harlem led in 17 of the 18 leading causes of death.

The Response by Columbia Presbyterian Medical Center

The response to community medical need by CPMC has occurred at two levels: service delivery and education/research. The Presbyterian Hospital in cooperation with the Departments of Medicine, Paediatrics, Obstetrics and Gynaecology, and the School of Dental and Oral Surgery has offered new health care delivery programmes. These started with the creation of an Ambulatory Care Network Corporation (ACNC) with three satellite health centres located in Washington Heights - Inwood. The Presbyterian Hospital has also opened a new community hospital in the Inwood neighbourhood. In addition, Columbia University has an affiliation contract to provide professional staff to the Harlem Hospital. These efforts of service delivery are largely external to the Medical Center. They proceed at the periphery, but they may impact substantially on Medical Center priorities in the future. Health of the Public complements these efforts by directing attention inside the medical centre, addressing education/research priorities and cultivating students and Faculty members who will be responsive to community needs.

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[i] Medicaid is the federal health insurance programme for the poor in the United States. It is funded partly by federal and partly by state taxes, but the states control the eligibility standards and comprehensiveness of benefits. As a result, the programme has enormous variability throughout the United States and in most states, covers only the very poor.

[ii] Medically indigent applies to those who have no health insurance in the United States. These are mostly "near-poor", who earn incomes too high to be eligible for Medicaid, but too low to buy health insurance. Thus they may not technically be "indigent" as defined by federal standards for poverty level incomes, but they are indigent with respect to paying for medical care.

Health of the Public at Columbia

Health of the Public at Columbia intervenes at every level of the curriculum - before students start professional school, during the pre-clinical and clinical years and at the post-graduate level. In order to do this, we established an Office of Clinical Public Health, with a separate identity and staff, but part of the Dean's Office in the School of Public Health. This office, in turn, provides administrative support for programme groups which have representatives from the Schools of Dentistry, Medicine, Nursing, Public Health and Harlem Hospital. A work group has been established for each part of the curriculum that was to be changed. Each group has developed its own objectives and educational interventions, while bearing in mind the programmes of the other groups. The goal is to develop a continuum of educational interventions that will ultimately have coherence and a real impact on students' learning and career choices. The four groups are: Joint Degree Work Group, Pre-Clinical Work Group, Clinical Work Group, and Post-Graduate Work Group.

The Joint Degree Work Group

The design, planning and conduct of the first Summer Pre-professional short course in Clinical Public Health was the major programme priority for the Joint Degree Work Group. Table II outlines the objectives of this work group.

The Summer Course was a six-day, intensive course in health administration and health care organisation for six students nurses, and six medical and three dental students at an attractive off-campus location in August. It was staffed by one physician, one nurse and one dentist, each holding a second degree in public health. Visiting staff included the Dean of the School of Public Health, the Dean of the Nursing School, representatives from the Divisions of Epidemiology, Sociomedical Sciences, Occupational and Environmental Health, Population and Family Health, Geriatrics and Gerontology, Health Policy and Management, a dentist from the City Health Department and a physician from the Department of Medicine. There were three organising principles.

Table II. Objectives of the pre-professional summer short course

1) Provide a limited number of interested students with a basic understanding of the administrative component of clinical public health

2) Provide an orientation to the total perspective of clinical public health by introducing its other components: clinical care and research

3) Instill in professional students with public health interests a sense of identity and collegiality

4) Expose students to role models, so that they can begin to form more concrete career plans and choose advisors and elective courses

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1) A health administration course: Morning and afternoon seminar sessions focused on health care organisation. These eleven sessions presented the equivalent of the School of Public Health Core Course on Health Administration, restructured for maximum relevance to the three pre-professional groups and the conceptual framework of clinical public health. Of the three areas of professional activity involved in clinical public health (clinical care, research and administration), health administration is the one students are best prepared to deal with before learning pathophysiology in their professional school. The seminars made liberal use of videotapes and interactive teaching methods such as role-playing.
2) Exposure to School of Public Health divisions and additional role models: Each lunch and dinner session featured a guest. The guests were drawn from each division in the school of public health. The meal was followed by a brief, informal discussion of that division's course offerings, research and involvement in clinical and community service activities. Whenever possible, divisional representatives were joint degree-holders who served as role models. Frequently, the guest also conducted the seminar that preceeded or followed the meal.
3) The synthesis of clinical public health: In the evenings, there was a separate series of seminars that complemented the in-depth exploration of health administration by giving students a taste of the other two components of clinical public health - research and clinical care. These seminars also demonstrated how all the components of the clinical public health concept come together, in a case-method format.

The Summer Course was envisioned as a way of offering to the most interested incoming dental, medical and nursing students an intensive introduction to the issues in contemporary clinical public health and health care organisation. It was designed to give students a 3-credit head start on the Masters in Public Health and an opportunity to meet staff from the major Divisions in the School of Public Health, thereby encouraging the participating students to apply for the joint degree programme (i.e. MD/MPH, DDS/MPH, MS/MPH).

It was also intended to foster collegial relationships among students and staff from the different schools through small group interaction. We hoped to set in motion a process that would sustain student interest in public health during the demanding years of clinical training. The course was described by participants as a "smashing" success. Student evaluations were unanimously positive, and one Faculty member felt it "was the most significant teaching experience of my career". One sign of success is that all participants have enrolled in the joint degree programme, representing a substantial increase in students enrolled in the joint degree programme.

Overall, cooperation from the dental, medical and nursing schools was superb. Lists of students accepted into professional school were provided to the Office of Clinical Public Health, and letters describing the short course were sent to all entering freshmen. Each discipline identified a Faculty member in residence so that all students would have a Faculty mentor. These Faculty members selected reading material that reflected their disciplines, and curriculum teaching was divided to exploit the talents of the staff and recognise their discipline specific issues and roles.

The second priority of the Joint Degree Work Group involved the establishment of a second course designed to bring together all Course graduates on a monthly basis. This course, Seminars in Clinical Public Health, has been approved for one credit toward the MPH. Each seminar will focus on a contemporary issue in Public Health and will bring students in contact with Faculty role models from within and outside Columbia University. By opening the seminar to other students, our goal is to involve more students in public health pursuits. This emphasis, however, is really the work of our second Work Group.

The Pre-Clinical Work Group

The Summer Course is an educational intervention directed at a narrow cross-section of the most interested students and is directed at retaining their interest in population-based health science. The Pre-Clinical Programme is designed to offer something for every first and second year dental, medical and nurse student. The objectives of this group are listed in Table III. This was an attempt to develop a programme that could affect all students in all three schools. The enormous practical problems of accomplishing this objective became apparent when we could not find a date and time to convene Faculty members from the three schools because of schedule conflicts. But once it did convene, this group had the most imaginative interdisciplinary discussion of all the groups. The meetings were often attended by other staff members who expressed an interest in the development of the interdisciplinary projects for students.

Table III. Pre-clinical group objectives

1) Develop a programme with the potential to affect all students in all three schools

2) Provide an opportunity for "meaningful" experience during the pre-clinical years which presently are dominated by book learning

3) Encourage learning experiences that have both a clinical and a community service component

4) Emphasize interdisciplinary learning experiences as much as possible.

The idea of a "Student Designer's Panel" was conceived to facilitate student involvement with the planning of the pre-clinical projects. Dental, medical and nurse students were invited through class announcements. The result was an extremely exciting student - staff dialogue. Students' ideas for projects soon evolved into formal proposals. Table IV delineates the final 22 Clinical Public Health Projects.

In order to make the projects available to students from the three schools, a "Project Fair" was planned, the result of one student's idea. At the Fair, project preceptors met small groups or individual students to describe the proposed project. The turn out of over 130 students exceeded everyone's expectations. At the conclusion of the Fair, students and preceptors expressed their preferences. Every student was matched to a project, and preceptors began to convene their groups in the following month.

At the same time that the pre-clinical projects were developed, efforts were made to introduce a more population-orientated curriculum for first year medical students. The Division of General Medicine spearheaded these initiatives. The Patient-Physician Relationship Course, which had previously focused on the microcosm of doctor-patient interaction, now introduced several sessions on the societal context in which that relationship takes place. These efforts were directed at illustrating how population sciences are the basic sciences of clinical practice.

Table IV. Clinical public health projects

- Behavioural modification programme and its effect on weight control, lipid profiles, blood pressure & nutritional insight in a group of Hispanic elderly
- Breastfeeding clinic
- Cholesterol screening & education
- Development of educational materials for families of sick newborn
- Evaluation of diarrhoea & malaria control programmes in Nicaragua
- Diabetic teaching
- Health education in clinic waiting rooms
- Health promotion in infancy
- Health services for the homeless
- Heart healthy eating
- Interface of medicine & religion
- Monitoring new quality assurance process for municipal hospitals
- Patient involvement in do-not-resuscitate decision
- Preventing baby tooth decay
- Psychosocial aspects of illness
- Self-breast exam. teaching
- Young male prostitutes: AIDS knowledge & sexual behaviour
- High School AIDS education
- AIDS: ethics & research
- Preventive dental care video
- Video on crack
- Video evaluation on parenting

The Clinical Work Group

The objectives are to enhance the teaching of the natural history and management of chronic illness, cost-effective diagnostic decision making, and social/behavioural/preventive interventions in clinical practice for dental, medical and nurse students in their years of clinical training.

In the first year, the Clinical Work Group focused its attention on the medical school (Table V). The fourth year medical courses in Ambulatory Care and Public Health are the only required courses. Public health had not had a didactic programme, and ambulatory care was taken outside the Columbia "family" institutions by close to one third of the student body.

Table V. Clinical group objectives

1) Develop a population-based curriculum that speaks to the needs of dental, medical and nurse students engaged in clinical training

2) Ffocus on ambulatory care training as the clinical experience that enhances the teaching of the natural history and management of chronic illness, cost-effective diagnostic decision making and preventive interventions

For these reasons, Health of the Public earmarked these rotations for initial attention. One of the coordinators of the Clinical Work Group visited all the major ambulatory sites in the Columbia "family". Potential sites for future rotations were also visited. Two major proposals were advanced: 1) over the next 2-3 years, emphasis be placed on insuring that all Columbia students have a more uniform experience in ambulatory teaching by requiring that the ambulatory selective be taken within the Columbia family institutions and by promoting the development of criteria to guide course content, and 2) an ambulatory teaching unit for medical students be created at the Presbyterian Hospital. This unit would include video-taping capacity, in order to promote the teaching of interviewing, and computer support for the student public health research projects.

The other major initiative of the group was to inaugurate changes in the required fourth year Public Health selective, which is usually paired with the Ambulatory Care rotation. Previously, this course consisted of student designed and executed public health research projects. Teaching focused on the questions of design and analysis that were raised by individual student projects. The Clinical Work Group wished to transform the course for one half day per week into a seminar with presentations of didactic material. After several meetings of the Group, it was decided to develop four major topics: 1) a review of basic epidemiology - including study design and biostatistics; 2) techniques for critically appraising the medical literature; 3) preventive interventions in medical practice, and 4) the principles of clinical decision making. Curriculum materials were developed for each topic and distributed each month prior to the rotation. In the coming years, the group will evaluate this decision and explore its applicability to the dental and nursing schools.

The Post-Graduate Work Group

This group had the mandate to design educational interventions during residency and fellowship training (Table VI). While this intervention appears most appropriate for physician trainees, the group felt that Dentists and Masters level nurses were also potential target groups. Nevertheless, initial emphasis was placed on residency programmes in Internal Medicine and Paediatrics.

Table VI. Post-graduate group objectives

1) Develop population-based teaching programmes for residents in Medicine, Paediatrics, Obstetrics and Gynaecology, and Psychiatry
2) Encourage residents to embark on research projects with an epidemiological or health services research focus
3) Organise a fellowship programme oriented toward training potential faculty members in clinical public health

In Internal Medicine, a mini-course in Epidemiology for medical residents was developed during their noon conference hour (Table VII). In Paediatrics, Health of the Public worked with Faculty staff to redesign the Journal Club using critical appraisal approaches. In both instances, residents were encouraged to embrace a population-based paradigm in order to understand the literature and pursue contemporary research. In the Department of Medicine third year residents were encouraged to participate in public health-orientated research projects.

Primary Care Residency programmes in many institutions have provided the nidus for introducing more population-based training. At Columbia there has been reluctance to introduce a primary care training programme into a tertiary care programme. The Post-Graduate Groups has introduced a proposal to the Department of Medicine which is presently considering a primary care track for a subset of residents.

Table VII. Epidemiology mini-course for residents

Session 1:	Epidemiology as the science of medical practice
Session 2:	Basic Biostatistics: or all you need to know about P values
Session 3:	Do-it-yourself study design
Session 4:	More Biostatistics: multivariate techniques and other handy tools
Session 5:	Advanced topics: confounding stratification, effect modification
Session 6:	Meta-analysis: how to put it all together.

Fellowship training is the last component of this group's task. It was decided that the Health of the Public fellowship would have the following characteristics: 1) a two year term; 2) a 70% emphasis on skills acquisition by obtaining a Masters degree in Public Health and completing a research project; 3) a teaching component, including participation in the Health of the Public pre-clinical or clinical programmes as a preceptor; 4) a 30% clinical component. Two fellows began the programme in July 1988, one in General Internal Medicine, the other in the School of Dentistry.

One aspect of the fellowship is to establish links with the other Health of the Public interventions. In the first year, it seemed most appropriate to have the fellows participate in the pre-clinical programme as Clinical Public Health project preceptors. In the second year, after completing course work in the School of Public Health, they may be able to act as preceptors in the fourth year public health selective. This use of Health of the Public fellows as role models for students is an exciting integrating quality made possible by a programme with interventions at all levels of the curriculum.

Conclusion

Health of the Public at Columbia is a programme of multiple educational interventions addressed at students and post-graduates in Dentistry, Medicine and Nursing. Interventions are directed at 1) health professional students who need to know the basic science of a population-oriented curriculum, in order to be effective clinicians;

2) a core of students who come to professional school with a prime interest in public health; and 3) professional school graduates engaged in post-graduate training experiences.

The purpose of these interventions is to provide a solid foundation in population-based science for all trainees, while at the same time retaining those who start with a special interest in public health and recruiting more into their ranks.

By developing educational interventions at every level of the curriculum - Health of the Public at Columbia generates the need for more Faculty staff to teach all the proposed interventions. The importance of role models and mentors for students who elect this pathway is emphasised. The intent is to set in motion a process whereby the growth of the intervention leads to demand for teachers, who are in part supplied by graduates of the interventions. In this way, Health of the Public at Columbia becomes an internal force within the academic medical centre for addressing the population-based needs of the community.

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MEDICAL EDUCATION WORLDWIDE

World Federation for Medical Education

Henry Walton
Edinburgh, Scotland

Relations between WFME and the Network

The President, Professor Henry Walton, addressed the 6th Biennial General Meeting of the Network on 18 September 1989, and described the progress of the International Collaborative Programme, recommended at the World Conference on Medical Education. Professor Walton appealed for the partnership of the Network in mounting, monitoring and implementing the Projects, in all six Regions, at global, regional, national and institutional levels, which have been, and are being, proposed. Professor Walton formally made this request for partnership in the Executive Committee of the Network later on 18 September, and the request has been accepted.

The Ministerial Consultation for Africa

The Ministerial Consultation for Africa was held on 5-7 July 1989 in Abuja, Nigeria. The host Ministers were Professor O. Ransome-Kuti and Professor J. Aminu With the Government of Nigeria, the WHO Regional Office for Africa and the World Federation for Medical Education were the main organisers. The chairman of the Local Organising Committee was Professor O. Akinkugbe. The Abuja "Plan of Action" adopted as its main conclusion that both Ministries of Health and of Education should combine, in each country and regionally, for the actions that flow from the Regional Conferences and the World Conference on Medical Education. The next steps to be taken were agreed, notably the setting up of a Task Force in Brazzaville.

The report of the Consultation has been published in English and French: "Medical Education in Africa: An Agenda for Change" and is reproduced on page .....

The Task Force for Africa

A Task Force to implement the Edinburgh Declaration in the African countries has been set up in Brazzaville under the aegis of the WHO African Office. The

Federation will be represented at its first meeting by Professor O. Akinkugbe, and Professor K. Mukelabai will attend on behalf of the Association of Medical Schools of Africa.

World Health Assembly

The World Health Assembly on 19 May 1989 adopted Resolution WHA 42.38, which drew attention to the Edinburgh Declaration on the reform of medical education, and called on Member States to give serious consideration to, and to disseminate, the recommendations and concepts embodied in the Report of the World Conference.

Regional Committees of WHO

The Directing Council of the WHO American Office (PAHO) adopted a resolution similar to WHA 42.38 in September 1988.

The Regional Committee of WHO Regional Office for Africa at Niamey, Niger, 6-13 September, adopted a resolution in support of the Edinburgh Declaration, WFME was represented by Professor K. Mukelabai.

The Regional Committee of the WHO Regional Office for South East Asia met in Bandung, Indonesia, on 26 September - 2 October, and adopted a similar resolution.

The Regional Committee of the WHO Regional Office for Europe met in Paris on 12-16 September, where the Federation was represented by Professor Gunnar Ström. A similar resolution will be formulated and presented in 1990.

Expert Committee of Problem-Based Learning

The monograph of the WFME Expert Committee on Problem-Based Learning, edited by H.J. Walton and M.B. Matthews, has been published (Medical Education, 1989, vol. 23, pp. 538-558) and will be issued as an ASME Medical Education Booklet. Dundee: Association for the Study of Medical Education.

Third International Conference on Continuing Medical Education

WFME is one of the organisers of the series of World Conferences, the third to be held at the Annenberg Center, Palm Springs, California, on 14-18 December: "The Global Challenge". All the Presidents of the six Regional Associations which WFME contains will be present: Professor Ström, AMEE, Europe; Professor Mukelabai, AMSA, Africa; Professor Hamad, AMEME, the Middle East; Dr.

Pulido, PAFAMS, the Americas; Professor Mahmud, AMEWP, Western Pacific; and Professor Bajaj, AMESEA, South-East Asia. The goal of the Conference is to develop specific strategies for CME development.

Further information: World Federation for Medical Education, University of Edinburgh, Teviot Place, Edinburgh EH8 9AG, Scotland, United Kingdom

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The Abuja Plan of Action: Arising from the African Ministerial Consultation on Medical Education, 7 July 1989, Abuja, Nigeria

a. The Ministerial Consultation on Medical Education - An Agenda for Change - was called by the Government of Nigeria, the Regional Office of the World Health Organisation and the World Federation for Medical Education. The Consultation was a logical follow-up to the World programme of the World Federation of Medical Education leading up to the Conference on Medical Education which took place in Edinburgh in August 1988.

b. The meeting is unique in bringing together for the first time Ministers of Health and Education in the African Region supported by an assemblage of senior government officials, heads of institutions, Provosts and Deans of Medical Schools, Chief Medical Directors and representatives of allied professional institutions and organisations.

c. Its central mission was to rethink the purpose and reshape the content of medical education in Africa in consonance with the imperatives of Primary Health Care.

d. The Consultation was assisted in its deliberations by various initiatives that had taken place at institutional, national, regional and global levels, notably the Brazzaville and Edinburgh meetings in 1987 and 1988.

e. The three themes that formed the basis of the Consultation were:
- Political will and mobilisation;
- Relevance and resources in medical education;
- An overview of existing medical education systems in the African Region and their orientation towards Primary Health Care.

f. Throughout the plenaries and group discussions emphasis was placed on the aspects of change in medical education that pertain to the African situation. The need to improve the health of the entire community makes it compelling to relate efforts at change to the elements of Primary Health Care.

g. Any envisaged change must take into cognisance the socio-cultural structure of African societies.

h. In order to generate awareness for the need to proceed in a planned and purposeful manner, the Consultation approved the following courses of action. These have been structured by levels of implementation within a designated time-frame. It would take on the format of institutional, national, regional and global activities as well as immediate, medium and long-term plans:

1989-1990

i. During this period it will be necessary to establish a National Task Force on Medical Education and a Regional Task Force under the auspices of the WHO, AMSA and CAMAS.

ii. Convene meetings of Provosts and Deans of Medical Schools and Representatives of the Ministries at the national level (or regional between countries in which there might be only one Medical School). These will aim at drawing up national plans for implementation of required changes in the curricula.

iii. Broad-based Faculty Curriculum Committees will also need to be set up by Provosts and Deans of Medical Schools to initiate the process of change and monitor progress.

1990-1991

Through joint initiatives at institutional, national, regional and international levels, it will be necessary to organise workshops, focused on orientation and training of Faculty members and other categories of health manpower, to facilitate implementation. Intersectoral and multidisciplinary health development projects (practice areas) will also need to be addressed in the same manner.

Other areas of joint endeavour will include community mobilisation, development of appropriate learning resources and provision of infrastructure such as accommodation, transportation and library services to facilitate the desired objective of relating the medical curricula to the delivery of Primary Health Care.

The delegates to the Consultation resolve to bring about, in each of their countries, the necessary actions to reorient the training of doctors in keeping with the health needs of the communities in which they serve.

The following countries were represented:

Angola, Benin, Burkina Faso, Cape Verde, Cameroun, Chad, Ethiopia, The Gambia, Ghana, Guinea Bissau, Liberia, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, Swaziland, Togo, Uganda, Zambia, Zimbabwe.

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Ten Commandments for Clinical Training *

Andrew R. Hornblow
Christchurch School of Medicine
Christchurch, New Zealand

Introduction

The pervasive process of curricula review in medical schools has as one of its outcomes more explicit definition of the objectives of medical education, and strategies by which these may be attained. A less common, but perhaps equally important outcome is that of open discussion with students of the learning and socialisation processes which are core elements in clinical training. At a time of increasing emphasis on problem-based and self-directed learning, and continuing education beyond graduation, the need for students to understand and monitor their own professional progress is of paramount importance.

Clinical training presents stressors with which most students learn to cope, but which are disabling for many at certain stages, and sufficiently distressing for some to lead them to withdraw from the course. Clinical training cannot and should not be devoid of stress. Stress is an inevitable part of medical practice, and, moreover, psychological research indicates some anxiety or stress to be necessary for optimal performance on most tasks (Levi, 1981). Nevertheless, optimal performance and job satisfaction depend on occupational stress being managed appropriately at both individual and organisational levels (Hornblow, 1988). For students to function effectively as they acquire their professional skills it is important that they have some understanding of the particular stresses of their chosen profession, and attitudes and behavioural strategies likely to facilitate their handling of such pressures.

Research on the medical education process has produced a now extensive list of major stress factors encountered by students and adverse consequences of such stress (Hornblow, 1982). Reported stressors include information overload, deciding what material is most relevant, inadequate evaluation and assessment systems, lack of feedback regarding performance, fear of making a mistake in clinical work,

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inadequate support in working with dying patients and their relatives, role confusion in relation to patients and staff, poor staff/student relationships, inconsistency between ideal doctor and available models, non-availability of female role models, difficulty in selecting future specialty/career options, lack of time for recreation and non-work relationships, and problems of maintaining dual student/spouse roles. Predictably, identified responses to such stressors are equally diverse. Reported adverse consequences of stress in medical education include inadequate eating, sleeping and exercise patterns, disabling levels of anxiety and depression, concentration difficulties and inefficient time use, material acquired rapidly forgotten, sacrifice of one course to do well in another, constant pressure to work without enjoying learning, neglect of journal reading, poor attendance at classes, neglect of and conflict in relationships, and increased cynicism, pessimism, irritability and self-doubt.

The length of the above lists of stressors and stress reactions should not be taken as indicative of a greater level of stress among medical students than among those in other courses, or the general population. Stress related dysfunction is probably no greater among medical students than other groups (Hornblow, 1982). Nevertheless, the stance adopted above, that students should learn to recognise the stresses of their own profession and learn to handle these to their own and their patients' benefit remains a valid one.

At the beginning of the 1988 academic year Ten Commandments for Those Undertaking Clinical Training were shared with fourth year medical students of the Christchurch School of Medicine, a School which this year discontinued its four-afternoons-per-week clinical sciences course lecture series to extend problem-based learning in the wards and the community. These commandments are presented below.

The Commandments - Thou shalt not:

1) Lose the motivation which comes from a sense of direction

The finding that students with external locus of control tend to experience more stress in their clinical training (Kilpatrick et al., 1974) affirms the need for students to develop a personal sense of direction and control in the learning process, both as regards long and short-term goals. In terms of their long-term career options, students should be helped to survey actively the smorgasbord of medical specialties, in the light of their own interests and strenghts. Most medical schools aim to turn out an undifferentiated doctor on graduation, while at the same time often creating a sense of bewilderment and confusion among students encountering the intricacies and challenges of one specialty field after another. Short-term goals can be identified more clearly, and motivation enhanced, if expectations and objectives are clearly stated. Both in terms of specialty area and doctoring style, students must learn to answer for themselves the question "What does it mean for me to become a good doctor in my own eyes?".

2) Assume the road to the goal is straight

While recognising the need for a sense of direction to maintain motivation, students should also be encouraged to recognise that the path to any career goal is rarely straight. To function effectively in clinical practice, whatever their final area of specialisation, students need to have explored the diversity of medicine, if only to come to terms with their own limitations and ignorance. Further, without some opportunity to adopt a broad view of their professional roles and responsibilities, the acquisition of wisdom - the often unstated but fundamental goal of medical education - is likely to be impeded. Student handbooks typically present an array of objectives for the learning of knowledge, skills and attitudes, but the learning of wisdom does not appear in the set curriculum. In an age of increasing specialisation, there are pressures against students developing the sense of proportion and breadth of perspective they will need to function wisely as well as efficiently.

3) Forget that your best teachers are likely to be your patients

Problem-based learning recognises the assumption that learning tends to be more effective, and motivation to learn higher, where the student is confronted with a problem to be resolved. Clinical learning is most effective where students relate directly to patients, identifying their presenting problems, and drawing on their teacher's expertise to understand diagnosis and management. Beyond the clinical task *per se*, it is only through close interaction with patients that students can gain some understanding of pain and suffering, the stages of illness and healing, and learn to respond with humility and respect.

4) Through excessive enthusiasm or incompetence do harm to your patient

It is perhaps natural for students to fear they will make mistakes, or that these will become public knowledge. It is necessary that students recognise that the making of professional judgments carries the risk of error, and that this should not be feared. Rather to be avoided is the harm consequent on over-enthusiasm or incompetence, such as an ill-timed intervention for a patient unwilling or not ready to move forward, or failure to diagnose presenting illness.

5) Ignore your patients' feelings or steal their self-respect

Humane care demands sensitivity to patients' feelings and acknowledgement of the right of all to self-respect. As well as being a central principle of professional conduct, sensitivity to patients' feelings and attitudes is important for its impact on clinical outcome. Substantial research now indicates that interpersonal aspects of the doctor/patient relationship influence clinical outcome for good or ill and that to disregard the patients' affective world or undermine their self-respect constitutes inadequate care (Sanson-Fisher et al., 1980). In acquiring empathic skills, a dilemma for the sensitive student may be that of learning to balance complementary aspects of the empathic process, those of being able to identify closely with the patient's affect while retaining enough distance not to be overcome by it. For the less sensitive student the converse may be true, distance retained without adequate identification with the patient.

6) Disregard the strength of a supportive peer group

The time-honoured tradition of students learning together in close - knit peer groups has support from social science research which emphasises the importance of supportive social networks in counteracting stress (Flannery, 1987). As well as the buffering effect provided by a peer group, for students to learn to function cooperatively, as part of a team, lays the basis for subsequent professional interdependence where the sharing of skills and knowledge is a critical part of medical practice.

7) Assume all staff teach the same way

While general principles underlying the learning process are well-known (Boland et al., 1985), there is no simple formula for effective teaching. The personal styles of teachers may vary markedly, or for a given teacher, vary from one situation to another, but may nevertheless facilitate the learning process. Students should be encouraged to recognise, and profit from variation in style, while also recognising when, whatever the style, teachers fail to create a learning environment. To use a cricketing analogy, the student, as batsman, can learn from the fast bowler as well as the spinner and may even find the occasional bouncer instructive.

8) Identify with teachers' or consultants' delusions of grandeur

In an age of specialisation, with rapid obsolescence of knowledge and skills, status tends to be defined by one's work role and level of expertise. To be recognised as an expert carries with it the occupational hazard of vulnerability to arrogance and grandiosity. Medical practice is no exception. Indeed, given the tendency for patients and staff to attribute power and wisdom to the consultant, humility may be in short supply. Students should be encouraged to recognise that illness and psychological dependency tend to result in the attributing of power to the clinician, a process with which clinicians are encouraged to collude. Students should be encouraged to discuss the limits of a clinician's powers and role and, given the power of modelling as a form of learning, should be discouraged from identifying with, or (perhaps worse!) reinforcing delusions of grandeur among their mentors.

9) Earn a reputation for unreliability and forgetfulness
Clinical medical training, unlike many undergraduate courses, occurs in a service context where the student is expected to know and practice the prevailing code for professional behaviour. Students' anxieties in an unfamiliar environment and role can be relieved by the making explicit of ground rules relating to interprofessional relationships, contact with patients, expectations regarding dress and attendance, and so on.

10) Neglect to nurture appreciation of humour, joy, beauty and mystery in life
At least for some students, clinical training has been shown to increase cynicism, reduce feelings of humanitarianism, and restrict activities likely to counterbalance the pressures of professional training (Hornblow, 1982). Extensive psychological research indicates that perception of one's environment is a subjective process (Hastorf et al., 1970), also that a sense of self-efficacy enhances wellbeing and effective functioning (Bandura,1986). Professional training involves the learning of new ground rules for perceiving one's human and physical environment, and a redefinition of one's efficacy in responding to day-to-day tasks and challenges. Just as illness, pain, suffering and disability change the attitudes and perceptions of patients, so too can they change the student's world view. For their own personal growth, and better professional functioning, students should be encouraged to seek and value humour, joy, beauty and mystery in life. To recognise and affirm only the darker colours in the mosaic of everyday life is to ignore a source of strength vital to patients, students and staff.

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Knowledge, Learning and Literacy: The Didactic and the Critical*

Richard W. Paul
Sonoma State University
Rohnert Park, CA, United States of America

Most instructional practice in most academic institutions around the world presupposes a didactic theory of knowledge, learning and literacy, ill-suited to the development of critical minds and literate persons. After a superficial exposure to reading, writing and arithmetic, schooling is typically fragmented thereafter into more or less technical domains, each with a large technical vocabulary and an extensive content or propositional base. Students memorise and reiterate domain-specific details. Teachers lecture and drill. Active integration of the students' daily non-academic experiences is rare. Little time is spent stimulating student questions. Students are not typically encouraged to doubt what they are told in the classroom or what is written in their texts. Students' personal points of view or philosophies of life are considered largely irrelevant to education. Classrooms with teachers talking and students listening are the rule. Dense and typically speedy coverage of content is typically followed by content-specific testing. Interdisciplinary synthesis is ordinarily viewed as a personal responsibility of the student and is not routinely tested. Technical specialisation is considered the natural goal of schooling and correlated with getting a job. Few multi-logical issues or problems are discussed or assigned and even fewer teachers know how to conduct such discussions or assess student participation in them. Students are rarely expected to engage in dialogical or dialectical reasoning and few teachers are proficient analysts of such reasoning. Knowledge is viewed as verified intra-disciplinary propositions and well-supported intra-disciplinary theories. There is little or no discussion of the nature of prejudice or bias, little or no discussion of metacognition, little or no discussion of what a disciplined, self-directed mind or self-directed thought require. The student is expected to develop into a literate educated person through years of what is essentially content memorisation and ritual performance.

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The above dominant pattern of academic instruction and learning is based on an uncritical theory of knowledge, learning and literacy that is coming under increasing critique by those whose concern is instruction fitted to new interpretations of the emerging economic and social conditions as well as to changing conditions for human survival.

Now let us set out the two opposing theories systematically in terms of specific contrasting assumptions.

The scholastically dominant theory of knowledge, learning and literacy assumes:	**The emerging critical theory of knowledge, learning and literacy assumes:**
1. That the fundamental need of students is to be taught more or less directly what to think, not how to think (that students will learn how to think if they can only get into their heads what to think).	1. That the fundamental need of students is to be taught how not what to think. That it is important to focus on significant content, but this should be accomplished by raising live issues that stimulate students to gather, analyse and assess that content.
2. That knowledge is independent of the thinking that generates, organises, and applies it.	2. That all knowledge or "content" is generated, organised, applied, analysed, synthesised, and assessed by thinking; that gaining knowledge is unintelligible without engagement in such thinking (it is not assumed that one can think without something, some content, to think about, nor that all content is equally significant and useful).

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
3. That an educated literate person is fundamentally a repository of content analogous to an encyclopedia or a data bank, directly comparing situations in the world with "facts" that he or she carries about fully formed as a result of an absorptive process. That an educated literate person is fundamentally a true believer, that is, a possessor of truth, and therefore claims much knowledge.	3. That an educated literate person is fundamentally a repository of strategies, principles, concepts and insights embedded in processes of thought rather than in atomic facts. Experiences analysed and organised by critical thought, rather than facts picked up one-by-one, characterise the educated person. Much of what is "known" is constructed by the thinker as needed from context to context not prefabricated in sets of true statements about the world. That an educated literate person is fundamentally a seeker and questioner rather than a true believer, therefore cautious in claiming knowledge, being aware of many unknowns.
4. That knowledge, truth and understanding can be transmitted from one person to another by verbal statements in the form of lectures or didactic teaching.	4. That knowledge and truth can rarely, and insight never, be transmitted from one person to another by the transmitter's verbal statements alone. That one person cannot directly give another what he has learned; one can only facilitate the conditions under which people learn for themselves by figuring out or thinking things through.

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
5. That students do not need to be taught skills of listening in order to learn from others, they only need to learn to pay attention and this is fundamentally a matter of self-discipline achieved through will-power. Students should therefore be able to do so on command by the teacher.	5. That students need to be taught how to listen critically; an active and skilled process that can be learned by degrees with various levels of proficiency. Learning what another person means by what he says requires questioning, trying on, testing, hence engaging in public or private dialogue with him or her, and this involves critical thinking skills.
6. That the basic skills of reading and writing can be taught without emphasis on higher-order critical thinking skills.	6. That the basic skills of reading and writing are inferential skills that require critical thinking, that students who do not learn to read and write critically are defective readers and writers, and that critical reading and writing involve dialogical processes in which probing critical questions are raised and answered. (What is the fundamental issue? What reasons, what evidence is relevant to this issue? Is this source or authority credible? Are these reasons adequate? Is this evidence accurate and sufficient? Does this contradict that? Does this conclusion follow? Is another point of view relevant to consider?)
7. That students who have no questions typically are learning well, while students with a lot of questions are experiencing difficulty in learning; that doubt and questioning weaken belief.	7. That students who have no questions typically are not learning, while having pointed and specific questions, on the other hand, is a significant sign of learning. Doubt and questioning, by deepening understanding, strengthen belief by putting it on more solid ground.

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
8. That quiet classes with little student talk are typically reflective of students learning while classes with a lot of student talk are typically disadvantaged in learning.	8. That quiet classes with little student talk are typically classes with little learning, while student talk, focused on live issues, is a sign of learning (provided students learn dialogical and dialectical skills).
9. That knowledge and truth can typically be learned best by being broken down into elements - the elements into sub-elements - each taught sequentially and atomically. Knowledge is additive.	9. That knowledge and truth is heavily systemic and/or holistic and can be learned only by many on-going acts of synthesis, many goings back and forth between wholes and parts, tentative graspings of a whole guiding us in understanding its parts, periodic focusings on the parts (in relation to each other) shedding light upon the whole, and that the wholes that we learn have important relations to other wholes as well as to their own parts and hence need to be frequently canvassed in learning any given whole (this assumption has the implication that we cannot achieve in-depth learning in any given domain of knowledge unless the process of grasping that domain involves active consideration of its relation to other domains of knowledge). That each learner creates knowledge.
10. That people can gain significant knowledge without seeking or valuing it, and hence that education can take place without a significant transformation of values for the learner.	10. That the people gain only the knowledge that they seek and value. All other learning is superficial and/or transitory. All genuine education transforms the basic values of the person educated, resulting in persons becoming life-long learners and rational persons.

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
11. That understanding the mind and how it functions, its epistemological health and pathology, are not important or necessary parts of learning. To learn the basic subject matter of the schools one need not focus on such matters, except perhaps with certain disadvantaged learners.	11. That understanding the mind and how it functions, its health and pathology, are important; are necessary parts of learning. To learn the basic subject matter of the schools in-depth requires that we gain some insight into how we as a thinker and learner are processing that subject matter.
12. That ignorance is a vacuum or simple lack, and that students' prejudices, biases, misconceptions and ignorance are automatically replaced by their being given knowledge.	12. That prejudices, biases and misconceptions are built up through actively constructed inferences embedded in experience and must be broken down through a similar process; hence, that students must reason their way dialogically and dialectically out of their prejudices, biases and misconceptions. Thus students need many opportunities to express their views in class no matter how biased and prejudiced those views might be and a non-threatening environment to argue their way out of their internalised misconceptions.
13. That students need not understand the rational ground or deeper logic of what they learn to absorb knowledge. Extensive but superficial learning can later be deepened.	13. That rational assent is an essential facet of all genuine learning and that an in-depth understanding of basic concepts and principles is an essential foundation for rational assent to non-foundational concepts and facts. That in-depth understanding of root concepts and principles should be used as organisers for learning within and across subject matter domains.

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
14. That it is more important to cover a great deal of knowledge or information superficially than a small amount in depth.	14. That it is more important to cover a small amount of knowledge or information in depth (deeply probing its foundation) than to cover a great deal of knowledge superficially.
15. That the roles of teacher and learner are distinct and should not be blurred.	15. That we learn best by teaching or explaining to others what we know, and so that students need lots of opportunities to teach what they know to others, to formulate their understanding in different ways, and to respond to diverse questions from other learners.
16. That the teacher should correct the learner's ignorance by telling him what he does not know.	16. That the students need to learn to distinguish for themselves what they know from what they do not know. Much of what students are presently learning should be recognised by the students as content that they do not genuinely know or comprehend, but they have merely memorised. Self-directed recognition of ignorance is necessary to learning.
17. That the teacher has the fundamental responsibility for student learning.	17. That, progressively, the student should be given increasing responsibility for his own learning. Students need to come to see that only they can learn for themselves and that they will not do so unless they actively and willingly engage themselves in the process.

The scholastically dominant theory of knowledge, learning and literacy assumes:	***The emerging critical theory of knowledge, learning and literacy assumes:***
18. That students will automatically transfer the knowledge that they learn in didactically taught courses to relevant real-life situations.	18. That most knowledge that students memorise in didactically taught courses is either forgotten or rendered "inert" by their mode of learning it, and that the most significant transfer is achieved by in-depth learning which focuses on experiences meaningful to the students and aims directly at transfer.
19. That the personal experience of the students has no essential role to play in education.	19. That the personal experience of the student is essential to all schooling at all levels and in all subjects, that it is a crucial part of the content to be processed: applied, analysed, synthesised and assessed by the student.
20. That a student who can correctly answer questions, provide definitions, apply formulae while taking tests has proven his or her knowledge/understanding of those details.	20. That students can often provide correct answers, repeat definitions and apply formulae while yet not understanding those questions, definitions or formulae. That proof of knowledge/understanding is found in the students' ability to explain in their own words, with examples the meaning and significance of the knowledge, why it is so, and to spontaneously recall and use it when relevant.

The scholastically dominant theory of knowledge, learning and literacy assumes:	*The emerging critical theory of knowledge, learning and literacy assumes:*
21. That learning is essentially a private monological process in which learners can proceed more or less directly to establish truth, under the guidance of an expert in such truth. The authoritative answers that the teacher has are the fundamental standards for assessing students' learning.	21. That learning is essentially a public, communal dialogical and dialectical process in which learners can only proceed indirectly to truth, with much zigging and zagging along the way, much back-tracking, misconception, self-contradiction and frustration in the process. In this process authoritative answers are replaced by authoritative standards for engagement in the communal, dialogical process of enquiry.

Conclusion

Recognition of the need for a shift from a didactic to a critical theory of knowledge, learning and literacy is growing daily as the research base for a critical theory expands. The traditional didactic theory is increasingly on the defensive. It has few official defenders. Nevertheless it is still deeply embedded in classroom instruction as well as in the minds of most teachers and administrators. Implementation of the critical theory of knowledge, learning and literacy is merely beginning. Its full development around the world is probably 10 to 25 years into the future.

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FROM THE LITERATURE

Some Recent Books

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Some Recent Papers

With the generous consent of the editors of *Academic Medicine*, *Medical Education*, *Medical Teacher*, and *Teaching and Learning in Medicine* we have reproduced the abstracts of a number of papers that may be of particular interest to readers of the Annals. We have arranged the abstracts under the following headings: Primary Health Care, Problem-based Learning, Change, Student Selection, Communication, Assessment and Evaluation.

The addresses for ordering these journals are:
Academic Medicine: Association of American Medical Colleges, 1 Dupont Circle, N.W., Washington, DC 20036, U.S.A.
Medical Education: Blackwell Publishing Co., P.O. Box 88, Oxford, OX2 0NE, U.K.
Medical Teacher: Carfax Publishing Co., P.O. Box 24, Abington, OX14 2UE, U.K.
Teaching and Learning in Medicine: Lawrence Erlbaum Associates,
365 Broadway, Hillsdale, New Jersey 07642, U.S.A.

Primary Health Care

Indian Student Doctors' Attitudes towards Primary Health Care, Poverty and Related Issues. Ramalingaswami, P. (1989).
Medical Education, 23, 463-471.

An attempt is made to study the attitudes of student physicians towards primary health care, poverty and related social issues in India. The sample consisted of 464 men and 228 women final-year medical students (a total of 692) from 11 medical colleges in India. An open-ended questionnaire was used. Content analysis was performed on the responses. There were no statistically significant differences between the responses of the students belonging to different socio-economic groups. There were some differences in the responses of the men and women students, especially on the question of poverty and related social issues.

The data presented here show that the student physicians do not have a clear understanding of the primary health care approach, or about the social issues that influence health. This study underlines the need for exposing student physicians to the essential aspects of poverty and its impact on health and the importance of the primary health care approach for providing health care to disadvantaged groups.

Impact of a Required Family Medicine Clerkship on Medical Students' Attitudes about Primary Care. Duerson, M.C., Crandall, L.A., & Dwyer, J.W. (1989). *Academic Medicine, 64,* 546-548.

A study of 314 medical students before and after a required third-year clerkship in family medicine explored relationships among exposure to the clerkship and changes in attitudes toward primary care. The survey instrument contained 29 statements distinguishing the philosophy of primary care from that of subspecialty-oriented medicine and asked students to state their future residency plans. The responses of the primary care and subspecialty-oriented groups were the most disparate, whereas the students who were uncertain about residency plans shifted on several items from an alignment with the specialty group toward an alignment with the primary care group. This study shows that experience in a family medicine clerkship may be associated with changes in attitudes that represent development of a more informed image of primary care.

Health Promotion in the Medical Curriculum. Gillies, P.A., & Elwood, J.M. (1989). *Medical Education, 23,* 440-446.

It has been argued that health promotion should be included in the medical curriculum, if medical education is to match the needs and health goals of communities. In spite of the medical profession's awareness of the importance of health promotion, few universities in the U.K. have introduced a substantive course on the subject.

This paper describes the teaching of health promotion in the Nottingham Medical School. It identifies the aims and objectives of the course which are amongst others to develop an understanding of: the factors which influence the perception and experience of health and illness; the concepts of health promotion and health education; the scientific basis of health promotion; the relative effectiveness of approaches used; the measurement of health status and health behaviour; and health policy and planning. An innovative element of the teaching involves a community project which gives students experience of health promotion in practice.

Evaluation of the impact of the course suggests that students perceive it to be interesting, stimulating and enjoyable, whilst examination and continuous assessment indicate that it has also influenced students' knowledge and understanding of the subject.

Setting Educational Priorities for Learning the Concepts of Population Health. MacDonald, P.J., Chong, J.P., Chongtrakul, P., Neufeld, V.R., Tugwell, P. Chambers, L.W., Pickering, R.J., & Oates, M.J. (1989).
Medical Education, 23, 429-439.
Following the World Health Organisation's policy of "Health for All by the Year 2000", doctors are increasingly being seen as health care providers to populations of patients, in addition to their more traditional role as doctors to individuals in a one-to-one encounter. In order for doctors to take on this expanded role, they must learn the knowledge and skills appropriate to population health. In this paper, we propose a method of educational priority-setting which allows educational planners to identify those diseases and adverse health conditions most appropriate for studying the concepts of population health. Using the Measurement Iterative Loop of Tugwell and colleagues as a framework, a Table of Priority Illness Conditions was developed and compared with a previous priority list developed from a survey of clinical teachers at the McMaster University Medical School. Discussion of the implications for this approach in setting educational priorities at undergraduate, postgraduate and continuing medical education levels is presented, along with a review of possible shortcomings and *caveats* in using this approach.

A Community-Based Learning Experience for Medical Students. Schreier, R.A., & Danilewitz, D. (1989).
Medical Education, 23, 86-90.
A programme in which medical students are attached to Children's Institutions for one year is described. The students' role embraces a medical and psychosocial component in which students conduct clinics, screening programmes and health education, as well as develop relationships with individuals and groups of children. This experiential learning programme enables medical students to obtain an understanding of children's needs and work through their own feelings which are aroused when confronted with children who have been deprived and abused.

Problem-Based Learning

Approaches to Learning in a Problem-Based Medical Programme: a Developmental Study. Volder de, M.L., & Grave de, W.S. (1989).
Medical Education, 23, 262-264.
In this study we investigate how the introductory phase of the problem-based medical programme in Maastricht affects the study methods of students. On the first day of the academic year, 142 men and women medical students completed

the Short Inventory of Study Approaches and again at the end of the introductory period. The study indicates that these study methods are fostered by training in problem-based learning given during the introductory period.

A Curriculum on Medical Ignorance. Witte, M.H., Kerwin, A., Witte, C.L., & Scadron, A. (1989).
Medical Education, 23, 24-29.
The information and technology explosions in medicine have exposed the vast realm of ignorance in human biology, as well as the transience of accepted knowledge and shortcomings of instructional methods which foster rote memorisation, excessive reliance on conflicting data bases, and short-answer testing. To circumvent this serious deficiency in medical education, we have initiated a multifaceted Curriculum on Medical Ignorance consisting of "questioning" seminars and hands-on clinical and laboratory experiences. This teaching programme not only emphazises medicine's current deficiencies and limited insight into disease processes (i.e. ignorance), but also assists students in developing attitudes and behaviours to investigate basic biological and clinical unknowns while rendering sound everyday clinical decisions in the face of fragmentary understanding. Based on evaluative feedback over the past 3 years, participants have made substantial progress towards recognising and dealing constructively with medical ignorance and the limitations of "knowledge of the day", thereby preparing them for the certain uncertainty of future medical practice.

A Second Look at Consequences for Medical Education of Problem Solving in Science and Medicine. Whitman, N.A., Burgess, P.R., & Petajan, J.H. (1989).
Academic Medicine, 64, 548-549.
This article reports that most freshman and senior medical students in one medical school were not able to solve a written problem case, concerning back pain, that required the examinee to recognise that foot drop was a key physical finding. The students' responses were not influenced by the fact that half of the examinations listed the foot drop finding first and the other half listed it seventh in a list of eight physical findings. The authors conclude that the outcome of this sample problem hints at a fault in medical education: the failure of medical students to learn the skill of formulating overall hypotheses and subhypotheses before choosing treatment options.

Active, Small Group Learning with a Large Group in a Lecture Theatre: a Practical Example. Schwartz, P.L. (1989).

Medical Teacher, 11, 81-86.

Using a specific example within clinical biochemistry, I describe the structure and operation of a type of session which allows a large number of students in a lecture theatre to obtain some of the benefits of learning in small groups and from peers. After preparatory reading before the class, the students work in small self-selected groups on a number of problems or cases for 30-35 minutes of a 50-minute session. Each group must record on the blackboard its answers to key questions before the problems are discussed. The method is designed to highlight a small number of important concepts, to let students see the relevance of what they have learned, and to give the students practice in applying biochemistry to the solution of problems. The students have received the sessions well, and I have been impressed with how well the students have functioned during their discussions.

Self-Directed Learning: a Matched Control Trial. Peng Wen-wei (1989).
Teaching and Learning in Medicine, 1, 78-81.

There is a conflict between the limited period of schooling for medical students and the unlimited expansion of knowledge in medicine. In response, the trend in medical education has been to move away from the conventional goal of information transfer and toward a goal of cultivation of medical students' abilities and intelligence, including self-directed learning. In 1983, students admitted to Sun Yat-sen University of Medical Sciences were randomly divided into a pilot group that experienced self-directed learning (SDL) and a conventional learning group. The SDL group (n = 102) received self-learning guidelines and a 30% to 57% reduction in the number of lecture hours. The SDL students organised their own group discussions. They then took the same examinations as the control group. For all examinations, that met reliability criteria, the total scores for the SDL group were higher than, or equal to the total scores for the control group, indicating successful cultivation of the students' self-learning abilities. The readjustments that have subsequently been made in the school's curricula are also described.

Change

Medical Education: How is Change to Come about? Ramalingaswami, V. (1989).
Medical Education, 23, 328-332.

The challenge to medical education as we enter the last decade of the century and face the next millennium is how to utilise the new knowledge of human learning to train medical students in applying the fruits of rapidly advancing science and technology to the moral imperative of fulfilling social needs. To bring about the reforms defined in the Edinburgh Declaration, adopted as globally applicable by the World Conference on Medical Education, intrinsic and extrinsic elements must act in synergy. The intrinsic elements are teachers, students and institutional frameworks; the extrinsic elements political will, administrative commitment and societal pressure. In the developing world, while there is much that medical schools themselves can do through intrinsic changes, their dependence on government support is so pervasive that such government support becomes an essential prerequisite for change. The creation of a cohesive organisational framework involving health and education ministries, the academic sector and professional bodies for a systematic and continuing study of medical education and for inducing and sustaining change are essential to facilitate the change process.

Changing Medical Education. Grant, J., & Gale, R. (1989).
Medical Education, *23*, 252-257.
This paper is based on one which was prepared to support the World Conference of the World Federation for Medical Education in August 1988. It is designed to provide a broad perspective on the essential elements of an educational change process. The paper covers the stages in designing a change strategy and highlights the difficulties that any change agent is likely to encounter. A review of the history of change in education and organisations is followed by discussion of the need for change and the ability to change. Reasons for resistance to change are presented and discussed. Implementation and reinforcement of change are considered before a final section on evaluation.

The Medical School as a Social Organisation: the Sources of Resistance to Change. Bloom, S.W. (1989).
Medical Education, *23*, 228-241.
Medical schools vary by nation and by culture but, for students, the experience appears to be very similar. Also, despite a half-century of radical changes in medical practice, education as a process of socialisation for the profession is relatively unchanged. At the same time, medical educators have frequently instituted curricular reforms. To analyse this history of reform without change, this paper first establishes what the content and structure of medical education is, and how it came to be that way; second it traces a process whereby the scientific mission of academic medicine has crowded out its social responsibility to train for society's most basic health-care delivery needs. The main argument is that medical education's manifest humanistic mission is little more than a screen for the research mission that is the major thrust of the institution's social structure.

Implementing Change in Medical Education in Developing Countries. Bandaranayake, R.C. (1989).
Medical Teacher, 11, 39-45.
Medical schools in developing countries are constantly faced with the problem of adapting an inherited style of education to suit local needs and constraints. Often these needs have changed considerably since the curriculum was first established. Yet the difficulty of bringing about curricular changes, especially in conventional medical schools, is well known. This paper attempts to guide innovators in developing countries, but many of the suggestions are appropriate to all innovators. The issue of international standards is closely scrutinised, and their hypothetical nature revealed. The detrimental effect of national licensing examinations on curricular innovation is discussed. The futility of *ad hoc* changes and the need for a carefully thought out philosophy of change which leads logically to new ways of educating future professionals are stressed. Guidelines for maintaining an innovation and for evaluating its short- and long-term outcomes are developed.

A Collaboration between two Innovative Medical Education Programmes in Egypt and the United States. Risley, B., Foley, R.P., Nooman, Z.M., Richards, R.W., Ezzat, E., & Maklady, F. (1989).
Medical Education, 23, 333-338.
In 1984, the Center for Educational Development at the University of Illinois at Chicago began to offer its Master of Health Professions Education leadership programme to 13 medical teachers on-site at Suez Canal University in Ismailia, Egypt. The central issue in this project was whether two institutions on different continents and representing different cultures could collaboratively develop and implement a relevant graduate programme. Of equal concern was whether the degree programme could be adapted to meet the needs of the teachers of a new innovative medical school in a developing country. The 13 doctors have now graduated. This paper describes the rationale for the enterprise, the planning phase of the project, the curriculum, problems that had to be overcome, and some indices of success.

The New Mexico Experiment: Educational Innovation and Institutional Change. Kaufman, A., Mennin, S.P., Waterman, R., Duban, S., Hansbarger, C., Silverblatt, H., Obenshain, S.S., Kantrowitz, M., Becker, T., Samet, J., & Wiese, W. (1989).
Academic Medicine, 64, 285-294.
Over the past ten years the University of New Mexico School of Medicine has

conducted an educational experiment featuring learner-centred, problem-based, community-oriented learning. The experiment was introduced into an established institution by means of an innovative educational track running parallel to the more conventional curriculum. Students in the innovative track, compared with those in the conventional track, tended to score lower on the National Board of Medical Examiners (NBME) Part I examination (basic sciences) and higher on NBME Part II (clinical sciences), received higher clinical grades on clinical clerkships, and experienced less distress. They were more likely than conventional-track students to retain their initial interest in or switch their preference to careers in family medicine. The parallel-track strategy for introducing curriculum reform succeeded in fostering institutional acceptance of continuing educational innovation. Generic steps in overcoming institutional barriers to change are identified.

The McMaster M.D. Programme: a Case Study of Renewal in Medical Education. Neufeld, V.R., Woodward, C.A., & MacLeod, S.M. (1989). *Academic Medicine, 64,* 423-432.

This paper presents four aspects of health professions education at McMaster University: (1) a review of the key elements of the history and distinctive approach of the Doctor of Medicine (M.D.) programme; (2) a description of the process and substance of curriculum change over the past decade, focusing on a major revision of the M.D. programme that began in 1983; (3) a summary of the findings of follow-up studies of McMaster M.D. programme graduates; and (4) an analysis of the current context within which the Faculty of Health Sciences (of which the M.D. programme is a part) is operating and a description of strategies for renewal that are being implemented. The evidence and experience to date support the assertion that satisfactory - and in some ways special - physicians can be prepared using the "McMaster approach" to medical education, but that continuous review and periodic major revisions of the educational programme are both necessary and possible; they must occur in concert with developments in other sectors of Faculty of Health Sciences activities.

Educational Development in an Established Medical School: Facilitating and Impeding Factors in Change at the Karolinska Institute. Mårtenson, D. (1989). *Medical Teacher, 11,* 17-25.

Some of the factors facilitating and impeding educational development in an established and research-orientated medical school are briefly described. During the past 16 years, the Karolinska Institute has undergone a process of change from traditional forms of teaching and assessing, to more problem-orientated, integrated, and student-centred approaches. A new curriculum has been implemented with earlier patient contact and the introduction of new subjects of relevance for the health needs of today. These innovations could be regarded as modest, but what has been achieved positively is a climate increasingly in favour of change. Examples are the introduction of criteria for assessing teachers' competence for promotion, the establishment of an academic department for research and development in medical education, and discussions have been initiated on establishing a problem-based parallel track. The author's personal perceptions of events contributing to a climate favouring change constitute an integral part of this paper.

Distress and Attitudes toward the Learning Environment: Effects of a Curriculum Innovation. Moore-West, M., Harrington, D.L., Mennin, S.P., Kaufman, A., & Skipper, B.J. (1989).
Teaching and Learning in Medicine, 1, 151-157.
The emergence of innovative curricula provides unique opportunities to examine how a modification in the learning environment might influence stress and attitudes among students in medicine. In 1979, the University of New Mexico School of Medicine implemented a problem-based, community-oriented, student-centred curriculum that runs concurrently with the larger traditional track. This longitudinal investigation compares the perceptions of distress and attitudes toward the learning environment of students in these two tracks. The Symptom Questionnaire and the Learning Environment Questionnaire were used to measure distress levels and attitudes toward the learning environment. Students completed these instruments at orientation (first semester) and during the second, third and fourth semesters of the first two years of medical school. The innovative-track students' perceptions of distress were significantly lower during the first two years of medical school than those of the traditional-track students. Their expectations and perceptions of the learning environment were more positive, and they found their curriculum more meaningful and flexible than did traditional-track students. These findings suggest that a student-centred, problem-based approach may more effectively help students handle the stress associated with mastering a large body of information and coping with distressing situations such as those encountered by the practising physicians.

An Education Programme to Reduce Unnecessary Laboratory Tests by Residents. Dowling, P.T., Alfonsi, G., Brown, M.I., & Culpepper, L. (1989).

Academic Medicine, 64, 410-412.

What are often called "little-ticket" items - X-rays and laboratory tests - account for 25-30% of all health care costs. Two such items were the focus of this study, which took place at an inner-city community health centre operated by the Department of Family Medicine of Cook County Hospital and involved 20 family practice residents over a period of nine weeks. The first item was the complete blood count (CBC) with differential, a prototype of a low-cost, high-volume test often ordered by reflex; the second, the thyroid stimulating hormone (TSH) test, a high-cost, low-volume test normally associated with a differential diagnosis or clinical reasoning. Through the use of a simple educational intervention based on quality of care, not cost-containment, and an audit feedback system, the authors were able to reduce significantly the rates of ordering TSH tests ($p < .001$) during the intervention. However, this effect showed signs of diminishing five months after the intervention ended. The percentage of CBCs clinically indicated did not change significantly as a result of this intervention.

Student Selection

Do Conventional and Innovative Medical Schools Recruit Different Students? Maheux, B., Béland, F., Pineault, R., Rivest, P., & Valois, L. (1989).
Medical Education, 23, 30-38.

A mail questionnaire was used to survey the social and demographic characteristics, educational background, attitudinal profiles and expected career choice of 243 first-year students enrolled in three US medical schools. The aim was to determine whether different types of schools selected different types of students. Two schools were considered as conventional whereas one school was considered as innovative both in its admission policies and in its curriculum which emphazises a biopsychosocial approach to health care. The survey achieved an 84% response rate. The results showed no difference in students' career expectations. Students recruited in the innovative school, however, differed from students recruited in the conventional schools with regard to their social and demographic characteristics, educational background and attitudinal profiles. This study suggests that as some medical schools are innovating in their curriculum and admission policies, new types of medical students are entering medicine. Implications of these results are discussed.

Using a Standardised-Patient Examination to Establish the Predictive Validity of the MCAT and Undergraduate GPA as Admissions Criteria. Colliver, J.A., Verhulst, S.J., & Williams, R.G. (1989).

Academic Medicine, 64, 482-484.

Performance of senior medical students on an objectively scored examination of clinical competence based on standardised-patient cases was used to assess the predictive validity of the two most commonly used admission measures, the Medical College Admissions Test and the undergraduate grade point average. The students were in the classes of 1986 and 1987 at Southern Illinois University School of Medicine. The correlations of the admissions measures with clinical performances were quite weak and none of the admissions measures consistently showed a clear advantage as a predictor of clinical performance. Correlations of the admissions measures with scores on National Board of Medical Examiners (NBME) Part I and Part II examinations were small to moderate, although somewhat larger than the correlations with clinical performances. Correlations were corrected for attenuation due to differential unreliabilities of the clinical examination results and the scores on NBME examinations, and for restriction of range due to the stringent medical school selection process. Corrected correlations were small to moderate and showed the same pattern as the uncorrected ones. The study documents that traditional admissions measures are useful for selecting students who will perform effectively in clinical as well as basic science settings.

Communication

The Curriculum of Communication Skills Teaching at Maastricht Medical School.
Dalen van, J., Zuidweg, J., & Collet, J. (1989).
Medical Education, 23, 55-61.

In the Skillslab at Maastricht Medical School students are prepared for their first encounters with patients. Students can focus on individual skills, separately mastering each skill in a controlled systematic manner. With this foundation students are better equipped to face the complex intellectual and emotional demands of real patients. A large proportion of training concerns communication skills. Features of Skillslab communication skills training programme are: (1) its continuity (once every 2 weeks, from year 1 to year 6); (2) a gradual increase of complexity in skills (basic interview skills, phases of interviews, entire interviews, problem patients); (3) a gradual increase of complexity in practice situations (apparatus, role-playing, simulated patients, real patients).

Evaluation shows students' and teachers' satisfaction with the programme. Comparison with conditions required for interpersonal skills training shows that these are fully met. However, there are drawbacks, which are described.

Teaching Skills Training for Health Professionals: Effects on Immediate Recall by Surrogate Patients. Lorenz, R.A., Pichert, J.W., Boswell, E.J., & Schlundt, D.G. (1989).
Teaching and Learning in Medicine, 1, 26-30.
Medical educators increasingly recognise patient education skills as an important component of professional curricula. Previous studies have suggested that a 30-hr course, "Effective Patient Teaching", improves health professionals' instructional skills. This study was designed to further evaluate programme impact on students' teaching skills and on their patients' recall. Course participants and untrained matched volunteers were asked to provide instruction based on standard content material. College students served as surrogate patients. After instruction, surrogate patients completed a recall questionnaire on the standard content. Course participants exceeded controls on 10 of 16 selected teaching skills. Trained students also taught more content ($p < .01$), and their patients recalled more of what was taught ($p < .05$). Time spent teaching was not a significant covariate. Extent of use of teaching skills correlated significantly with patients' recall ($r = .57, p < .01$). The results suggest that training that improves health professionals' teaching skills may have measurable impact on their patients.

Learning the Educator Role: a Course for Medical Students. Sobral, D.T. (1989).
Medical Education, 23, 70-76.
The design and evaluation of a revised course on educational skills for medical students is described. The overall aim of this elective was to help students develop a working concept of their educator role regarding themselves, their peers and their patients. The programme comprised 15 two-hour weekly meetings consisting of small-group discussion and exercises around issues of self-learning skills, peer teaching and the process of patient education. Advanced preparation was promoted by reading and special assignments. Self-assessment, peer-assessment and continuous assessment based on course-work were used to help student learning and to provide a basis for final grading. During a 3-year study period, the Course Valuing Inventory (CVI) and a goal-oriented questionnaire were used for course evaluation.

Evaluation done on five consecutive classes showed favourable indices of course attractiveness. It also showed broad progress of most students in the course goals and high positive CVI scores for cognitive, personal and behavioural learning, in addition to course valuing. Students' perceptions of improvement in self-appraisal, communication skills and personal growth were related findings. Significant, moderate correlations were found between CVI learning scores and both the self-ratings of progress in the course goals and of attitude towards the educator role. Reinforcement of the positive attitude towards this role was a valuable finding related to a lasting effect: a significant increase in the choice of undergraduate preceptorships by the participants when compared to the control sample of students not exposed to this learning experience.

Assessment and Evaluation

Results of the Second Clinical Skills Assessment Examination of the ECFMG. Conn, H.L., & Cody, R.P. (1989).
Academic Medicine, 64, 448-453.
To test the hypothesis that the clinical skills of many foreign medical graduates entering residencies in the United States are deficient, the Educational Commission for Foreign Medical Graduates (ECFMG) administered a second, more extensive pilot examination called the Clinical Skills Assessment Examination. The test was constructed after identifying those clinical skills considered to be suitable for testing in a large-scale examination conducted at multiple locations. The test was given to 635 foreign medical graduates (including 53 U.S. citizens) who had been certified by the ECFMG and to a reference sample of 123 graduates of U.S. medical schools. All of the graduates took the test prior to their first postgraduate year of training. The results did not differ significantly from those of a previous test. The clinical skills of 28% of the graduates of foreign medical schools who took the examination were found to be inadequate when compared with those of graduates of U.S. schools. The conclusion reached was that a clinical skills examination is feasible for inclusion in the ECFMG certification process.

Self-Assessment in Problem-Based Groups. Rezler, A.G. (1989).
Medical Teacher, 11, 151-156.
Medical students in a tutorial programme rated themselves in Year 1 and again in Year 2 on knowledge, reasoning, communication and interpersonal skills. Student and tutor ratings were similar in Year 1 but different in Year 2. Both self- and tutor ratings increased from Year 1 to Year 2, but self-ratings were independent of achievement while tutor ratings were related to achievement. Possible reasons for these results were discussed with reference to the learning goals of the tutorials.

What is Normative versus Criterion-Referenced Assessment? Turnbull, J.M. (1989).
Medical Teacher, 11, 145-150.
Any reform of the current medical curriculum requires a reappraisal of the

principles and practices of the evaluation system. The norm-referenced test which at this time is the primary method of evaluation, was initially designed to rank order students for the purpose of selection. Difficulties arise when it is used, as it currently is for the assessment of competence. The norm-referenced test is often insensitive to instruction and, while it provides information regarding the relative strengths and weaknesses of students in comparison to their peers, it does not provide an estimate of the absolute level of performance achieved. In addition to promoting competition among students, the norm-referenced test is less suitable for programme evaluation.

As it is the principal responsibility of a medical school to produce competent physicians and not to rank order them, it is more reasonable to compare student achievement to an external standard of performance or criterion. Criterion-referenced testing, then, is more suitable for the assessment of competence and, within this setting, percentage competency scores can be utilised when there is a need for the rank ordering of student achievement for the purpose of selection.

What is a Modified Essay Question? Knox, J.D.E. (1989).
Medical Teacher, 11, 51-55.

Medical education is moving to a more problem-orientated basis than was the case formerly. The Modified Essay Question has its origins in this movement, being introduced in the late 1960s as one assessment technique more suited to general practice than other traditional assessment methods. In its original form it is a paper exercise based on an evolving situation presented by a patient in primary care. Experience with the technique in different countries is briefly summarised, and its applications to assessment and to teaching are discussed. Despite shortcomings this method appears to be standing up to the test of time.

Factors Influencing Testing Time Requirements for Measurements Using Written Simulations. Norcini J.J., & Swanson, D.B. (1989).
Teaching and Learning in Medicine, 1, 85-91.

Review of the literature indicates that a major impediment to using written simulations is the large number of cases required to achieve an acceptable level of reproducibility or reliability. This article describes some of the factors affecting the reproducibility of simulation scores (and thus test length requirements) and identifies their impact. It concentrates on four factors affecting the reproducibility of simulations that assess a single skill: (a) score interpretation, (b) skill characteristics, (c) examinee characteristics, and (d) the scaling of scores.

With few exceptions, score interpretation, the characteristics of the skill and the

With few exceptions, score interpretation, the characteristics of the skill and the characteristics of the examinees are not under the test developer's control. Once the purpose of measurement is fixed, so are most of these factors. On the other hand, it is often possible to focus cases without trivialising them or hurting the representativeness of the examination. It is also possible to apply item response theory to simulations and take advantage of the strong assumptions of the models to reduce test length. These developments merit the most attention in the future because they hold the promise of reducing test length and allowing wider use of simulations.

Factors Influencing Reproducibility of Tests Using Standardised Patients. Swanson, D.B., & Norcini, J.J. (1989).
Teaching and Learning in Medicine, 1, 158-166.

Psychometric studies of assessment with standardised patients (SPs) have established that substantial testing time is required to obtain reproducible scores. Using data drawn from two recent large-scale studies, this article explores the reasons behind this result and suggests several strategies for reducing testing-time requirements.

Case-specificity - inconsistency of an examinee's performance over cases - appears to be the major source of measurement error in SP-based tests. Use of multiple SPs to play the same case role for different examinees does not affect reproducibility of scores at typical test lengths. Similarly, low-to-moderate levels of interrater agreement do not markedly affect score reproducibility, as long as a reasonably large number of cases are included in an assessment.

Often, SP-based assessment can be viewed within a mastery-testing framework, where reproducibility of pass-fail decisions, rather than scores, is of primary importance. Testing-time requirements within a mastery-testing framework depend, in part, on the quality of group performance in relation to the pass-fail point: If performance is quite good (or quite poor), relatively short tests can be used without compromising reproducibility of pass-fail decisions. Adoption of a sequential testing approach, in which a brief screening test is given initially to identify examinees close to the pass-fail point, can further reduce use of testing resources. Alternatively, SP-based assessment can be incorporated into batteries with written tests to reduce testing time without sacrificing beneficial educational effects.

Implications of Changing Student Characteristics for Programme Evaluations in a Problem-Based Curriculum. Blumberg, P., & Daugherty, S.R. (1989).
Teaching and Learning in Medicine, 1, 135-139.

Characteristics of students participating in the initial class of an alternative, problem-based curriculum were compared to those of students entering the same programme in successive years to test the hypothesis that there are differences over time in the types of students who participate. The pilot class was not representative of medical students in general or of the students who entered the programme in later years. Students in the first class were more introverted, had higher neuroticism scores, more external locus of control and less confidence in their ability to succeed as medical students. The number of students in each class who majored in a non-science discipline declined over the three classes studied. These data caution that for purposes of programme evaluation, successive classes should be examined individually. There are several reasons why the pilot class of a new programme may differ from subsequent classes and should not be used for summative programme evaluation. In addition to changes in the type of students, the programme itself and the way it is presented to students changes, as do criteria by which students are selected.

Full Members of the Network of Community-Oriented Educational Institutions for Health Sciences

- Faculty of Medicine, University of Newcastle, Australia
- College of Medicine and Medical Sciences, Arabian Gulf University, Bahrain
- College of Health Sciences, Ministry of Health, Bahrain
- Faculty of Health Sciences, McMaster University, Hamilton, Canada
- Faculty of Medicine, University of Sherbrooke, Sherbrooke, Canada
- Medical Faculty, Universidad de la Frontera, Temuco, Chile
- Faculty of Medicine, Escuela Colombiana de Medicina, Bogotá, Colombia
- University of Havana, Havana, Cuba
- Faculty of Medicine, Suez Canal University, Ismailia, Egypt
- Jimma Institute of Health Sciences, Jimma, Ethiopia
- Medical Faculty, University of Tampere, Tampere, Finland
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- School of Medical Sciences, University of Science and Technology, Kumasi, Ghana
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The Network of Community-Oriented Educational Institutions for Health Sciences

General Aim

The general aim of the Network is to provide mutual support to member institutions who wish to adapt their curricula to the health needs of the communities which they serve.

Main Objectives

There are five primary objectives:

- strengthening of membership institutions in their implementation of community-oriented learning and appropriate instructional methods;
- strengthening of faculty competences related to community-based education;
- developing techniques, approaches, methods and tools appropriate to a community-oriented curriculum, e.g. problem-based learning;
- promoting population concepts in the health services system and the curriculum;
- assisting institutions in countries that have decided to introduce innovations in the training of health personnel, with the ultimate goal to improve health care and to contribute to the achievement of "Health for All".

To achieve these primary objectives, several additional objectives have been stated:

- Facilitating the development of curricula for health professions which help students become competent in the solution of health problems of communities, as well as of individuals and families in a community context.

Problem-based learning is seen as a powerful educational strategy to maximise students' acquisition of relevant knowledge, skills and attitude. Specific considerations include:

- the systematic selection of problems and population based concepts which represent the health needs of the community;
- the definition of relevant skills, including skills in problem-solving, independent learning, critical appraisal of evidence, and teamwork;
- the strengthening of teaching capability of staff related to community-orientation and problem-based learning;
- the development of curriculum design methods and learning tools appropriate to a community- and problem-based curriculum;

- the design of procedures and tools for the assessment of student and graduate performance;
- the evaluation of innovative programmes including their contribution to the development of effective, efficient and humane health care, and the commitment to "Health for All by the Year 2000", as promoted by the World Health Organization.
- Implement health research programmes that include basic, applied and operational research that is relevant to health and health care problems in the community served by the institution. Particular attention is given to strengthening health systems and epidemiologic research.
- Establishing relationships with the health care services and health care delivery. This link is intended to promote coordination between health care services, health manpower development and the promotion of primary care.
- Describing and developing organisational and managament strategies which maximise the achievement of institutional goals within the community setting.

The Network sees community-orientation and problem-based learning as specific issues which merit particular emphasis at the present phase of evolution of education in the health sciences. As the needs for health care and the further development of the health sciences and practices change, the Network will reconsider its priorities in the education of health professionals.

Membership of the Network

Since 1979 the membership has grown to a total of 44 full member institutions and 73 associate member institutions in 1990. There are four types of membership:

Full membership can be acquired by educational institutions for health sciences which implement community-oriented education and which are willing to collaborate with other institutions in achieving the goals of the Network. Full members have voting rights.

Associate membership can be acquired by institutions, organisations or groups of people which are interested in the objectives of the Network and the activities that flow from them and who wish to play an active part in them. Associate membership can also be acquired with a view to the acquisition of full membership at a later stage. Associate members may not vote.

Corresponding membership can be acquired by individuals who are interested in the objectives of the Network. Corresponding members may not vote.

Honorary membership will be granted to individuals who have rendered exceptional service to the Network. Honorary members may not vote.